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RAILROAD GAZETTE

SATURDAY, DECEMBER 27, 1873.

Contributions.

Spliced Carriages on the Mexican Railway.

The Mexican Railway, which extends from the sea-port of Vera Cruz to Puebla and Mexico, a distance of about three hundred miles, has occupied several years in its construction. Political movements, and changes of government and other disturbing influences have all done their share to retard the completion of this great enterprise. The entire system was completed and opened for public traffic in January, 1873. For some years previous to this latter date portions of this line, or from Vera Cruz to "Paso-del-Macho," 47¼ miles, and from Puebla to Mexico, 115¾ miles, have been in operation.

As these pieces of lines presented no very exceptional features in the way of curves or gradients, the passenger carriages of the ordinary English pattern were found to answer very well.

When pushing on with the construction of the remaining portion of the line, connecting the lower with the upper table lands, it became necessary to consider some method of modifying the existing carriages to enable them to pass with safety and facility round the inevitable sharp curves which must be encountered in ascending the mountain range. The summit land of the railway on the upper table land is some 8,400 feet above the level of the sea; and the gradients and curves during the 60 miles before reaching the altitude are very heavy. There are more than 15 miles of line on one continuous gradient of 1 in 25, and also long and frequent lengths of 1 in 33 and 1 in 40.

SPLICED CARRIAGES ON THE MEXICAN RAILWAY.

It will be readily understood that if the characteristic features of the country necessitate such extremely steep gradients, so in like manner would curves of small radius become almost inevitable. In locating the line through the mountain range, advantage has been taken of the available spurs of the hill-sides, and although heavy works have been constructed in the way of cuttings, embankments, bridges and tunnels, it was found impossible, even with these, to obtain better curves than 325 feet and 350 feet radius, unless by increasing works of vast magnitude and expense. In view of these numerous curves of 325 and 350 feet radius, it was considered inexpedient to work the passenger traffic on this part of the line with carriages of the ordinary English pattern, having a right wheel base of 11, 12, or 14 feet. To have placed a four-wheeled American bogie truck at each end of such a short carriage, would have added greatly to the weight of the carriages, by employing eight wheels to carry the load, where four would be ample, and the tendency to lateral movement inherent in the bogie system would be much felt in a vehicle of so short a length.

It was at this time that the idea suggested itself to Mr. W. H. Mills, M. Inst., C. E., the General Manager of the line, to splice the carriages together in pairs and to make in this way one carriage about 45 or 48 feet long, with an American four-wheeled bogie truck at each end.

The carriages built by the Ashbury Carriage Co., England, offered special advantages for this splicing together. The main frames, which are of rolled wrought iron, have been spliced or fished together with strong wrought-iron joint plates 3 ft. 6 in. long, well riveted, thus making each of the main frames in one continuous piece or girder. To assist in stiffening these frames, three tension or truss rods 1¼ inch in diameter have been placed and carefully adjusted under the carriages. The carriage bodies, which are of teak, have also been strongly bolted together at the sides and roof. A four-wheeled centre-pin bogie truck built by Gilbert, Bush & Co., Troy, N. Y., has been placed at each end of the carriage. In addition to the Westinghouse air-brake, which is fitted up on all the carriages of the Mexican Railway, one brake placed on the top of the carriage applies the brake-shoes, which are of iron, to all the eight wheels at once.

The result of this splicing of two carriages together has been a perfect success, and all those that have been thus treated are now by far the easiest and smoothest running carriages on the line. They pass with ease around the sharp curves above alluded to, and for some weeks had to pass dail round two provisional curves of 150 feet radius.

The first of these spliced carriages commenced to run in January, 1871, and has now been running daily nearly three years. No repairs have been required beyond painting, varnishing and renewals of axle-box brasses. Several other carriages have since been altered in the same way.

The carriages having first and second-class accommodations are 46 ft. 3 in. long, and carry 74 passengers. They have three first-class compartments, each holding eight persons, and five second-class compartments of ten each.

The carriages combining second and third class are 44 ft. 9 in. long and carry 90 passengers. They have nine compartments, four for second class and five for third class, the compartments holding ten passengers.

These spliced carriages are in daily use on the through trains between Vera Cruz and Mexico, and are found equally efficient on the comparatively level and straight road on the upper plains, where the running speed is much faster than on the more difficult parts of the line. They are very easy both for the passengers and permanent way, and are free from shaking when running at high speed and do not grind when passing round sharp curves.

W. H. Mills.

December 5, 1873.

New York, December 10, 1873.

Mr. Mills has shown in the above document that his railway is without doubt the most difficult line of railway ever constructed over which is carried a large passenger traffic. He is entitled to great credit for the ingenuity and ability displayed in making the alterations named, and for the nerve and courage he evinced in attacking and altering an established system and introducing an American feature on a railway which is essentially English in its construction and management. His success in this innovation on English custom and English system has been marked, and will be more so as time rolls on and shows that this change—and with it the adoption of the cast-iron chilled-disc wheel—has added to the safety of the passengers, and introduced an economy not only in the rolling stock, but in the maintenance of way, and that it also reduces the engine power necessary to take a train over the road.

Mr. Mills tells me he took Mr. Crawley, the contractor for the line, on his recent visit to Mexico, into the city over a long distance in one of these cars at the rate of 45 to 50 miles an hour, Mr. Crawley confessing that he had never before ridden in a car that run so steadily and smoothly.

I am informed that on the "Cumbres," the difficult part of this line of railway, there are a few places where the engineer had to introduce gradients of 1 in 20—264 feet per mile—and, what is worse, combine this terrible gradient with a minimum curve of 325 feet radius, one of these places occurring on a bridge 300 feet above the bottom of the ravine.

W. W. Evans.

The Kingsbury Coupon Again.

Marietta, Pittsburgh & Cleveland Railway Company.

Marietta, O., December 8, 1873.

To the Editor of the Railroad Gazette:

In inviting criticisms, suggestions and objections to, as well as discussion upon the merits (if any) of what I may call *the Kingsbury Coupon*, through your columns, I had hoped that the subject matter of what I have received privately might have been given to the public to elicit a decided expression from some of my seniors who have "seen longer service" in the passenger business and are more fully acquainted with the needs of the travelling public. While some have stated objectionable features, it has been unanimously admitted that the coupon has the merits claimed for it, and co-operation has been granted very cordially by all of whom I have asked it, to solve the problem by a thorough practical test for the Marietta, Pittsburgh & Cleveland Railway. Since therefore you have extended me a cordial welcome, I will continue to run my *single track* line of discussion, *going through a siding* when necessary *to meet and pass* objections which I may be unable *to meet on the main track on my rights.*

I claim for it:

I. *Universality*—subject to the friendly co-operation of connecting lines beyond common centers; whose interests I maintain are mutual.

II. *Accommodation*—realizing most fully the American idea of "the greatest good to the greatest number," in that it accommodates *all.*

III. *Economy*, in at least these three particulars:

1. In quantity of forms, by displacing very many dead and consumptive (useless and occasionally used) forms now embalmed in all our ticket cases, and placing in their stead the comparatively few necessary living forms which shall "do good to all men as they have opportunity."

2. In printing, by reducing the number of forms to say 600, which being constantly in use may be printed in larger numbers and at a considerably less cost; at the same furnishing tickets to a much greater number of destinations.

3. In furniture, by bringing within the limits of a single ticket case the whole system as carried out by my attachment—the alphabetical, numbered slip.

I had already *taken a siding*, for objection of "O. B. Joyful," in your issue of November 29, presented also by one of my Chicago friends, viz.: "consumption of time in preparing the ticket," even by a very competent agent. There was an *intention* in the repeated writing to close one of Joyful's "loopholes," but I have concluded to adopt some other plan to prevent "raising the value of the coupon"—an objection advanced by another correspondent whom I may call "Smith." An examination of a new sample (herewith) will, I think, *open the switch* and let me out on the main track to meet the objection of "chemical erasure," which I have tried on my own coupon paper, and, do it ever so neatly, it is very perceptible that the erasure has been made. I insist that the destination written *only once* shall be *absolutely without alteration or erasure*, even to the destruction of a few tickets if necessary (which shall be so reported).

I cannot side-track for the objection that it upsets the "consecutive numbered system (the base of the ticket system and check on the agent)."

I propose to use the same system of consecutive numbers as at present in use; but what matters it if, an agent selling 100 tickets, those to the same station are not in consecutive order? He reports the various stations and the number to each in his day's sales, showing day's sales to be 100 tickets, Form —, From 0 to 100, ——, the coupons verifying his report. The present "check on the agent" remains in both systems.

"O. B." fires a broadside (good-naturedly) in parting at what is, in my case, not *vulnerable*, viz.: "novelty of idea."

I am free to confess that when I first thought of my coupon (although having had some connection with that "preadamite road") I was not aware that the ticket had even an "immediate connection" use, as my Garden City friend has since exhibited by a much handsomer sample than mine. [Let me speak a good word for him, that his *half loaf* may be eaten; but being as hungry as all have admitted to be, why not *surround* my *whole loaf?*]

While granting the *idea* to have been conceived by Cæsar, and

> "I du believe that I should give
> Wat's his'n unto Cæsar,"

I do claim the novel or other *application* of the idea to a much wider sphere of usefulness than it has hitherto enjoyed, by my attachment of the *alphabetical numbered list of stations on the terminal road, with the local rates set opposite (or cut rate where such station is a competing point); such list before use having been carefully overlooked (or furnished by the General Ticket Agent of such terminal road).*

Another correspondent objects "that some roads require the destination to assist in arriving at value of proportions where same is based upon a division of competitive rates."

This seems to me an arbitrary claim, and should not obtain for the following reasons:

1st. I send a sample of each form I put on sale to each general ticket agent who is represented by a coupon of that form, giving on each coupon its proportion.

2d. The rate from the initial point to the given center has been established by parties in interest.

3d. The rate over the terminal road does not affect the revenue of the other railroads represented (hence should not be required by them) so long as the station on such terminal road is not a competing point. Where it is a competing point, it is either a *center* (by my plan), or else the rate named on the alphabetical list is the established *competitive rate*, instead of the *local.*

Let me illustrate by the rate from Marietta to Peoria:

Marietta to Columbus (established)	$3.70
Columbus to Peoria, via. T. P. & W. (established)	14.05
Through	$17.75
Marietta to Columbus (as before) established	$3.70
Columbus to Chicago (established)	10.50
Chicago to Peoria, via. C. R. I. & P. (local)	5.25
Through	$19.45

Now, instead of making Chicago my *center* for Peoria business, I should make Peoria itself a *center* with the established rate, or else enter on my C. R. I. & P. list not the local rate, $5.25, but a cut rate, $3.55.

In glancing at objections, where entertained, I have tried to exhibit a practicable solution.

As all my correspondents, without exception, have expressed the desire to see realized what I claim, and to find relief from the manifold forms, I am more than ever assured that the desired relief *can be* attained by the hearty co-operation of those mutually interested (and are we not all?) in largely increasing travel by affording such facilities and conveniences as guides to the uninitiated, that they may find it *so easy* to make the first trip "to and fro through the earth" as to find renewed pleasure in repeated patronage of our various railway lines—and this, too, in the near future, before it shall be accounted felony by the new Ohio Constitution for one of us to render the public a service.

J. A. KINGSBURY.

NEW SAMPLE OF KINGSBURY COUPON.

Issued by Mar., Pitts. & Cleve. Railway Co.

MARIETTA
TO

M&P, PC&SL, LOCAL.

Form 38.

SAMPLE.

Issued by Mar., Pitts. & Cleve. Railway Co.

MARIETTA TO Station written below, on P., C. & St. L. Railway.

ONLY ON PRESENTATION OF THIS TICKET WITH CHECKS ATTACHED, AND NAME OF DESTINATION WITHOUT ALTERATION OR ERASURE.

If the Checks belonging to this Ticket are detached, or destination has been altered or erased, they will not be received for passage.

☞ Conductors are required to detach from this Ticket and take up the Checks over their respective roads. The Conductor upon the end of the route will take up this Ticket as well as the Check over this road.

J. A. KINGSBURY,
General Ticket Agent.

Issued by Mar., Pitts. & Cleve. Railway Co.

PITTS., CINCINNATI & ST. LOUIS R. W.

NEW COMERSTOWN to

By such train as stops at such station.
M&P, PC&SL.

This Check is not good if detached from the Ticket bearing signature and contract, nor if destination has been altered or erased.

Local on P., C. & St. L. R'y. | Form 38.

SAMPLE.

Issued by Mar., Pitts. & Cleve. Railway Co.

MARIETTA & PITTSBURGH R. R.

MARIETTA
TO
NEW COMERSTOWN.

M&P, PC&SL.

This Check is not good if detached from the Ticket bearing signature and contract.

Local on P., C. & St. L. R'y. | Form 38.

SAMPLE.

ABRIDGED ALPHABETICAL NUMBERED LIST OF STATIONS AND THEIR LOCAL RATES ON TERMINAL ROADS, TO BE USED WITH KINGSBURY COUPON.

[FORM 38.]
P., C. & ST. L. R. W.
—*from*—
NEW COMERSTOWN
—*to*—

	Local fares.
11—Cadiz	$1 75
16—Columbus	2 90
18—Coshocton	55
19—Dennison	65
21—Dresden Junction	1 00
46—Newark	1 75
67—Pittsburgh	3 50
68—Steubenville	2 00

Locomotive Reports—What is Essential to their Value.

CENTRAL PACIFIC RAILROAD.
SAN FRANCISCO, December 3, 1873.

TO THE EDITOR OF THE RAILROAD GAZETTE:

In your issue of November 22 you publish an article on "Uniformity of Locomotive Reports" and also a report of a committee appointed to devise some plan for the same. The question is one that has had a great amount of consideration, but is as yet as far from a desired ultimatum as ever. My ideas are that a uniform method of making locomotive reports can be of no benefit, except as used in comparison with other roads. The results demanded in order to make reports uniform can be arrived at; but when attained are the questions to be determined of importance enough to justify the trouble and expense?

A uniform method of computing mileage, and also keeping the accounts, so far as dollar and cents, and the proper distribution of the same are concerned, could easily be adopted but the knotty points neither begin nor end with this result.

For correct comparisons the following are some of the points to be considered and to be of any practical value must be embodied in our monthly reports, viz., size, kind, weight and condition of engines; fuel consumed, properly classified as to quality with fuel used on other roads; speed of trains, grades and curvatures, climate, condition of iron, maximum amount of steam carried, etc., etc. Taking it for granted that all these points could be reduced to a practical basis, for the sake of comparison, the question of cars and tonnage hauled is one that must enter largely into the proposition, and how can this best be determined?

Upon roads of even grades the number of cars hauled and the tonnage carried could be easily arrived at, while on other roads,—as our own, for instance, where on every division on the road but two engines are maintained as helpers that perform no other service but to help trains over the grades,—a difficulty presents itself. To give the train engine credit for hauling her train from home to destination, after having been "pushed" or "helped" over the hardest portion of her run, would seem hardly right.

Again: If an engine starts with 30 loaded cars, and during her run have 40 empty and 10 loaded, and finally make her destination with 15 cars, part empty and part loaded, how can the average number of cars she has hauled be arrived at? and when the number of cars has been arrived at, how are we to get at the tonnage the engine has hauled without ready reference to conductors' reports and way bills, and a great addition to our clerical force, which is always an objection? Assuming that we had all these points, how could such explanations as would be necessary be made on our monthly reports? I will instance another run on this road. An engine leaves Sacramento with a train of 54 freight cars, hauling them with ease 22 miles to Rocklin and the foot of the hill. This train is then "made up" into three trains of 18 cars each, and two engines coupled on to each train, and is hauled in this way over the mountain 97 miles to Truckee, so that five engines in addition to the one that started with the train from Sacramento are necessary to do the work. Now how many cars, without much fine figuring, is the engine running out of Sacramento entitled to for her whole run?

These points can be correctly gotten at, and while I can see how a uniformity in our reports might be of great advantage as an aid in determining the question as to whether one road was doing as well or better than another, I can't see how such uniformity can be brought about without considering the questions above; and that brings us back to the start, *i. e.*, after all has been attained, are the questions to be determined of importance enough to justify the trouble and expense?

That any benefits may be derived from questions of this kind it is necessary to keep them before the public, and I hope others interested will give us their ideas through the medium of your valuable journal.

C. A. GROW,
Auditor Motive Power and Machinery Department.

European Freight Tariffs.

[CONTINUED FROM PAGE 502.]

These are sufficient to confirm the opinion which has already been expressed in the course of the observations, so complete and profound, presented by M. Moussette, in his "Inquiry into the Management and Construction of English Railroads," viz.: *that in general the English tariffs are not lower than those in Germany, but in a great many cases are much higher.*

A further comparison with the usual tariffs in North Germany shows *that the English local tariff rates, on which competition has the least influence, are notably higher, while for short distances they are extraordinarily high;* and also that between the rates for the different classes there is a far greater margin than in Germany. By the local tariff of the Great Eastern, for example, the relation between units of different classes is as 1 to 7½, while on the Prussian railroads at the utmost it would be as 1 to 5.

So also the coal tariff of the Great Northern, which of all the roads terminating in London has the largest coal traffic, shows that even the minimum rate of ⅛d. per ton per mile for distances of 200 miles is not sensibly lower than the North German "pfennig" tariff (0.88 cent per ton per mile, with fixed charges of 30 cents per ton), considering that the English shipper must supply cars, for which the road pays no rent. In fact, taking the pfennig tariff and deducting one cent per axle per mile for rent, going and returning, the rate for 200 miles is only 0.82 cent per ton per mile. *For short distances, on the contrary, the English tariff is higher than the tariff of North Germany.* Thus at a distance of 46 miles, including the fixed charges and deducting the rent of cars, the pfennig tariff gives 1.3 cents, while the English tariff is 2.3 cents per ton per mile.

We do not consider it necessary to dwell upon these questions of detail, nor to make a special study of the private rates; although they are very extensively applied, and show still lower rates than the preceding (for coal transported by extra trains). But these tariffs are usually based upon special circumstances and local considerations. For us, therefore, they afford only a very subordinate interest, just as the special tariffs made in Germany—that for the transportation of rails in transit, for example—can have no general application.

The foregoing remarks show that, in an economical point of view, we ought to be satisfied with the rates which we enjoy in Germany.*a* Generally they are moderate in amount, increase but slightly for short distances and for the higher classes, and, especially, there is a great uniformity of rates on the different roads; and thus in the broadest sense they minister to the public interest. And it must be added that this result has been reached less by the operation of competition than through the influence of the Government, which, partly by the reduction of rates on the roads managed by itself, partly through other measures, has brought about a continual decrease of rates. Thus we have already reached a limit, in the lowest rates, which concerns nearly the income of the railroads, and any further reduction, without a corresponding reduction in working expenses, will endanger the interest on the cost of the roads.*b*

How far this is already the case with the "pfennig tariff" which has been introduced on the Prussian railroads for coal traffic may be seen from the following:

In the transportation of coal over mountain roads *c* with long grades of 52.8 feet per mile, where the performance of six coupled engines, with 120 pounds steam pressure, cylinders of 18⅛ inches diameter and 24⅛ inches stroke, even in favorable weather only amounts to the hauling of 50 axles (exclusive of two axles for the caboose) at 11,000 pounds per axle, on account of the lighter performance in unfavorable weather and of the difficulty of always securing full loads, it can scarcely be estimated at more than 45 axles carrying 11,000 pounds each on the average. If we consider that freight passing on its way over such lines and charged according to the pfennig tariff pays but 0.72 cent per ton per mile, since the terminal charges go only to the lines on which the freight is shipped or received, we see that the receipts of a train of 250 tons of coal are about $1.80 (gold) per mile, which is reduced to one-half, or 90 cents, in view of the fact that the train usually returns empty.

Now these receipts correspond, according to the statistics of the Prussian railroads for 1868, to an average expenditure of 1.84 cents per axle per mile—an expenditure which rises to 2.2 cents when renewals and repairs of rolling stock and road are included. For 45 plus 2=47 axles, the expense, therefore, is $1.03¼ per train mile, and is not even wholly covered by the receipts. So the relative lengths of grades to levels, and

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a The normal rates for local traffic on the Westphalian State Railroad, adopted also for the interchange of traffic with most of the North German railroads, are as follows per ton per mile. Express freight pays double these prices:

Class I		4.4 per cent.	
Class II	A	3.5 "	Plus 12.2 cents of fixed charges, divided between the forwarding and receiving station.
	B	2.6 "	
	C	2.2 "	
	D	1.8 "	
	E	1.3 "	Plus 15 cents of fixed charges.
	F	1.3 "	
	G	1.1 "	

Besides this tariff there are various special and exceptional tariffs, notably the "pfennig tariff" of one pfennig per centner per German mile (0.88 cent per ton per mile), with a fixed charge of 14 cents per ton, for shipments to the amount of at least ten tons of coal, ore, cinders, gypsum, guano, paving stones, ballast, etc.—AUTHOR'S NOTE.

b What the author says of the German freight rate may be applied with no less reason to the Belgian State rates.

These tariffs have passed through a series of phases curious to consider, if we would take account of the experiments to which the system of rates has been and still is subjected in order to reach the result most advantageous in the industrial and railroad point of view.

The first tariff properly so called for the transportation of freight dates from August 1, 1840, before which time the State contented itself with renting out its cars. The rates per ton per mile of this tariff suffered the following changes successively:

	First class.	Second class.	Third class.
1840	6 cents	4.2 cents	3.6 cents
1842	6 "	4.5 "	3 "
1845 (car-load)	5.4 "	4.2 "	..
1846 (less than car-load)	6 "	4.5 "	3.6 "

The first serious attempt at reduction was made in 1848. This reduction was made by abolishing all classification for freights in quantities greater than 220 pounds, and adopting a rate of 3 cents per ton per mile (the currency gold and the ton of 2,205 pounds), and a fixed charge of 18.6 cents per ton.

It is interesting, in order to measure the progress made since this first experiment, to know that this uniform rate per mile is precisely the maximum rate of our present tariffs.

With the object of introducing a new reduction of rates, we returned to classification in 1853, and the following rates per mile were established for heavy goods (1,100 pounds or more):

First class	3 cents
Second class	2.4 "
Third class	1.8 "

The first trial of a tariff decreasing with the distance was made January 1, 1861, for certain heavy freights (coal, pig iron, lime, paving stones). This tariff was as follows:

For 46½ miles or less	1.8 cents per mile.
For 46½ to 96 miles there was added	0.3 " "
For 99.2 miles the entire rate was	1.2 " "

—and 18.6 per ton was added as a fixed charge.

On the 1st of January, 1862, this tariff was extended so as to cover all third-class freight (bricks, limestone, flux, sand, etc.) February 1, the application of the differential system was made to second-class freight. These rates were:

For 46½ miles or less	2.4 cents per ton per mile.
From 46½ to 84 miles there was added	0.6 " " "

—and there was a fixed charge of 18.6 cents per ton. For 87 miles the rate became, including the fixed charge, 1.8 cents per ton per mile.

On the 1st of January, 1863, the same principle was extended to first-class freight by the publication of the following rates:

18½ miles or less	1.8 cents per ton per mile.
22 miles or more	1.5 " " "

—plus a fixed charge of 18.6 cents per ton.

June 10, 1864, these experiments resulted in an important reform: a fourth class was created for heavy freight, ranked in Germany in the category of the "pfennig tariff," and the differential rates were adopted for the three last classes, preserving for the first the charge of 3 cents for all distances. The benefit of the differential rates was not extended to goods of this class until 1865. Below is the schedule of September 1, 1865, which preserved, for the three last classes, the rates of the schedule of June 10, 1864:

First Class, Per load of 4 tons.	Up to 46½ miles	3.0 cents per ton per mile
	From 46½ to 93 there was added	2.4 " " "
	From 93 to 124 there was added	1.8 " " "
	For greater distances there was added	1.2 " " "
Second Class, Per load of 4 tons.	Up to 46½ miles	2.4 " " "
	For greater distances there was added	0.6 " " "
Third Class, Per load of 5 tons.	Up to 46½ miles	1.8 " " "
	For greater distances there was added	0.3 " " "
Fourth Class, Per load of 5 tons.	Up to 31 miles	1.2 " " "
	From 31 to 46½ there was added	0.9 " " "
	For greater distances there was added	0.3 " " "

a fixed charge of 18.6 cents per ton being added in all cases.

The slowness of increase of traffic soon led the Government to raise, in a certain measure, the rates of this extremely liberal tariff.

The following is the schedule of February 1, 1868, which is still in force on the lines of the Belgian Government:

First Class. Per load of 5 tons.	Up to 46½ miles	3.0 cents per ton per mile.
	From 46½ to 93, add	2.4 " " "
	From 93 to 124, add	1.8 " " "
	For greater distances, add	1.2 " " "
Second Class. Per load of 5 tons.	Up to 46½ miles	2.4 " " "
	From 46½ to 77½, add	1.2 " " "
	For greater distance, add	0.6 " " "
Third Class. Per load of 5 tons.	Up to 46½ miles	1.8 " " "
	From 46½ to 62, add	0.9 " " "
	From 62 to 77½, add	0.6 " " "
	For greater distances, add	0.3 " " "
Fourth Class. Per load of 5 tons.	Up to 46½ miles	1.2 " " "
	From 46½ to 62, add	0.6 " " "
	For greater distance, add	0.3 " " "

And a fixed charge of 18.6 cents per ton.—NOTE BY THE BELGIAN TRANSLATOR.

c On the 10¾ miles between Paderborn and Althofen, which with the exception of three short levels has an unbroken ascent of 52.8 feet per mile, and for the most part consists of curves of 3,084 feet radius, net loads of 275 tons (of 2,000 pounds) are moved by engines of this kind at a speed of 9.4 miles per hour, in favorable weather; in unfavorable weather, however, the load falls to three-fourths of this amount, and even then the time allowed is not always sufficient.—AUTHOR'S NOTE.

the amounts, usually limited, of return freights are the only circumstances which can reduce the deficit of 13¼ cents per mile and produce an excess of receipts sufficient to pay the interest on the capital invested. Now such a result can be counted upon only in exceptionally favorable circumstances. For, even if we admit that the cost of construction of a line with heavy grades does not exceed the very moderate sum of $90,000 (gold) per mile, and accepting an interest of 5 per cent., the remuneration of the capital requires daily net receipts of $12.33 per mile. This calculation, based upon official statistics, shows evidently that in the case of lines with grades over which the carrying is done at the rate of 0.72 cent per mile, with no share of the terminal charges, the limit at which transportation can be done has not only been reached but exceeded already. It is the same with the application of the pfennig tariff, with terminal charges, for short distances. In 1868 the ton of coal or coke was moved, on the average,

On the Saarbruck Railroad..... 13⅛ miles
On the Berg & Mark Railroad..... 27⅛ miles

Notwithstanding the apparently high rate of terminal charges, (25 cents gold per ton of 2,000 pounds) the rate per ton per mile obtained by estimating these expenses is :

a. On the Saarbruck Railroad..... 2.5 cents
b. On the Berg & Mark Railroad..... 1.6 cents

and these figures give as the gross product of a car of 22,000 pounds capacity

a. $3.66 gold per trip.
b. $4.93 " " "

We are not supplied with the necessary statistics for comparing these receipts with the corresponding expenses, since on distances so short local circumstances have a special influence on the working expenses.

When we reflect, however, that in very many cases these short hauls are not over one continuous line, but include the transfer from a branch line to another line; when we consider further that every car is withdrawn from the running stock nearly a day at the shipping and at the receiving station, that every car must be switched into and out of the train, run upon the siding for unloading, and in returning (generally empty) must be treated in the same way; finally, when we consider the extensive and costly side-tracks at coal stations, the great number of engines and men which are requisite for the switching service, we believe we may affirm, even without definite statistics, that even for short distances a *general* reduction of the fixed charges cannot be granted. The preceding coal tariff of the Great Northern Railroad serves as proof of this. Notwithstanding the furnishing of cars by the shippers, it begins with the rate of 1¾ cents per ton (2,000 lbs.) per mile and a terminal charge of 10⅓ cents; and generally in England transportation for short distances, and with good reason, costs considerably more than in Germany.

We must therefore accept as the result of the preceding investigation that the "pfennig tariff" (0.72 cent per ton of 2,000 lbs. per mile), with terminal charges of two thalers per 100 centners (25 cents per 2,000 lbs.) gives a suitable return only in case of favorable lengths of haul and favorable grades, and that therefore the extended application of tariff for coal, and on certain systems of lines for rock salt, gpysum, etc., should be fully appreciated.

Nevertheless we see many attempts made recently *d* to have the pfennig tariff established generally by legislative or executive enactment, for all distances, and whether the transportation is done by one or several companies, for coal, coke, timber, stone, ores, salt, manure, pig iron, or other similar freight, avoiding as much as possible accessory charges, and with the fixed charge not exceeding 12½ cents per ton of 2,000 pounds; or, in a word, that all heavy freights shall be carried by the pfennig tariff, with a simultaneous reduction of the existing terminal charges to one half.

According to the Prussian railroad statistics, *e* at least 75 per cent. of the total tonnage would have to be transported at this reduced pfennig tariff, and the consequence would be a very marked reduction of the receipts, and the decrease of several per cent. in the dividends.

Although the above proposition has had no result, and although it has been shown by proper authority that the constitution of the North-German Confederation does not authorize it to compel the railroads to reduce their tariffs, that at this time there is no necessity for the further reduction which was demanded, and finally that such a reduction of rates for all distances is not rational, still attempts of the same kind at reducing rates are sure to be repeated; and it is certainly not a superfluous precaution to take a determined attitude towards these attempts.

If the mines and mining industry, from which almost exclusively these movements come, were really in so precarious a condition that an extension of the reduced rates should be made in their favor, as is often said in support of such reduction, and if in the management of railroads regard were had only to the profits of the shareholders, then perhaps it might be a question whether, in order to support mining and industry, the railroads should not reduce their rates even below cost, and the State protect them from suffering from such action by a guarantee of interest, or otherwise.

Fortunately we are far enough from such principles, which, once applied to the railroads, in a similar manner might find application to mining and iron manufacturing, in favor of other branches of industry, and of agriculture especially.

In 1868 the total receipts of the Prussian railroads amounted to $67,368,256, and those of the mines and metallurgical works to $134,285,467 for the same year *f*. A comparison of these figures shows the superiority of the mines and furnaces over the railroads; so, if these opinions were to be generally accepted, perhaps the support of the railroads by the mines and metal industry—that is, by the reduction of the prices of coal and iron—could be justified quite as properly.

If we inquire further wherein that monopoly of the railroads which is so often harped upon really consists, we will find that, strictly speaking, it is only of a theoretical nature; while the idea so vaunted by political economists, coming down from the early days of the railroad system—that of granting to third parties the conduct of transportation on their own account at a fixed toll for the road—as yet has not come into practice. Moreover, the constant action of the Government and the steady influence of competition have confined to so narrow limits the evil consequences which a railroad monopoly could have that it appears quite questionable, in view of the existing low and uniform rate, whether further reductions of the rates may not be left to competition alone. And properly there remains to the railroads only this monopoly: to secure and to extend to a greater and greater extent continually, the great material and intellectual advantages which result from every increase and improvement in the means of transportation.

But for this there is needed the co-operation of capital, which, on account of the increased demand for railroad extensions and other undertakings, can be attracted only by assured and satisfactory profits.

A general reduction of the profits of railroads would therefore only serve to check the flow of capital into new railroad enterprises.

Seeing, then, that a reduction of rates in favor of mineral and metal products would check the development of railroads, and so exercise indirectly an unfavorable influence on mining and metallurgy; and considering, further, that with the present rates, on railroads which do not form main lines of traffic, a long time is required to reach the point where full interest is earned on the capital invested, we may accept it as a principle that *in the future any considerable reduction of rates can occur only with a corresponding reduction of working expenses.*

No slight obstacle to the further reduction of the pfennig tariff in connection with the ordinary terminal charge is formed by the practice hitherto, with a few exceptions, universally followed, of using this tariff for each single car-load, without reference to the total quantity.

If the natural criterion, the expenses, is admitted as the foundation for fixing rates, then it is evident that when coal, etc., are shipped in regular extra trains of a fixed size, the expenses at both terminal stations and on the road also will be the lowest possible; also the terminal expenses for two or more cars which are dispatched at the same time from one station for another will be at a less rate than for a single car. Moreover when larger quantities are shipped there is a certain reduction of the expenses for the reason that the expense of the shipment per mile includes not only the working expense per axle mile, but also the interest on a corresponding portion of the capital invested.

The English railroads have got over this difficulty by reducing the rates to the shipper according to the amount shipped by him yearly, and in view of the mercantile basis of English tariffs, it cannot be denied that there is a certain propriety in this principle.

Aside from the constant efforts of all roads to limit as far as possible the expenditures of all kinds in the technical and administrative departments, there is only one method of reducing expenses which is of special importance—the completest possible utilization of the road and rolling stock.

With regard to the utilization of the power of locomotives, it is hardly necessary to enlarge upon it, since in Germany the principle is generally followed to make the freight trains as large as possible, but to allow them only a low speed of about 14 miles per hour. And aside from the performance of the locomotives, it depends entirely on the conditions of the grades as to how far economy in working can be increased by a better utilization of the motive power.

But with regard to the utilization of the freight cars, there is still a wide field open for improvement, as a glance at the Prussian railroad statistics show; for, according to these, in the year 1868 each axle of a baggage or freight car travelled on an average only 10,264 miles, or 28 miles per day, with an average load of only 3,750 pounds, or 41.2 per cent. of the maximum load.

With regard to the number of miles run, this average has grown somewhat more favorable from year to year, however, since the average performance of each car axle in the year 1859 was only 8,400 miles, or 22¾ miles per day, still the above performance of 28 miles per day is so small that the most earnest attention should be given to attempts to increase this service. This object can be attained only by shortening the halts at stations, and by rapid loading and unloading at the terminal stations and by making close connections of trains on both lines at junction stations, since, as we have shown elsewhere, a greater speed of freight trains would have a trifling effect compared with the stops at stations, and moreover could not be obtained except at the cost of the motive power.

In the latter direction the unions of connecting railroads have sought to stimulate a faster movement of cars by introducing through coal and freight trains over long routes, with only short halts at the junction stations, and they have already materially advanced this object; although not infrequently certain instances, especially in transportation for great distances (as, for example, in the grain traffic from Hungary to the Rhine and the rail traffic in the opposite direction), show by the extremely light performance of the cars how much remains to be done in this direction.

So far as the reduction of delays at terminal stations is concerned, especially with cars loaded with coal and other coarse freights, the railroads depend largely on the co-operation of the public, and we believe that material aid may be looked for from the mines and manufacturers sharing in the supplying of cars, and from a more convenient construction of the cars and the provision of chutes by which the unloading of cars may be rendered easier than heretofore. Whether, in addition, the interest of the roads in a reduction of the stops at the stations may not be promoted by a reasonable charge for the *time* of cars, and whether other advantages should not be sought by an increase in the capacity of cars above the present maximum of 11,000 pounds per axle, may well deserve a more thorough investigation.

Although in the carrying of coal and other coarse freights any lessening of the cost depends chiefly on the quickness with which the cars can be put to use again, in which evidently the loading of the cars returning empty must not be left out of the account, still the full loading of cars must be kept in the foreground; since, although the capacity of 22,000 pounds per car is now generally introduced, and although cars of less capacity are already excluded from some railroads, there are still numerous special and exceptional tariffs which permit the shipping of all kinds of coarse freights in quantities of 11,000 pounds.

If, then, on various lines the car-load freights—such as pig iron, raw steel, blooms, scrap iron, old rails, ore, slag, gypsum, guano, paving stones, stone ballast, etc.—are carried in quantities of 11,000 pounds at the rate of 0.9 cent (gold) per ton (of 2,000 pounds) per mile, with a fixed charge of 6½ cents per ton, it is equivalent to a utilization of only one-half of the car, when these freights are shipped in cars of 22,000 pounds capacity. In this case the earnings are the same as if 22,000 pounds were carried at the rate of $\frac{0.9}{2} = 0.45$ cent per ton per mile.

Since these car-load freights are usually shipped in larger quantities, and since it is of no special advantage to the public to dispatch these freights in quantities of 11,000 pounds; and, moreover, since the excess of rolling stock is rarely great enough to admit of sending out cars of 22,000 pounds capacity with loads of only 11,000 pounds, the bad effect of this concession is much modified. Yet it is a notable feature of the present tariff system that at the very time when the application of the pfennig tariff to other heavy freights is declared inadmissible, the railroads ship partial loads of coarse freights at rates which, while nominally higher than the pfennig tariff, in reality are far lower.

Passing on to the covered cars, in the absence of any special statistics concerning the movement of these cars, we may conclude that the results are similar; for with these the long stops at stations are balanced by the longer trips which freight loaded in covered cars usually makes.

However, we have special information concerning the loads of covered freight cars which shows the whole extent of their imperfect utilization. The small load of 3,750 pounds with which, according to the Prussian railroad statistics, each axle is loaded on the average, of itself indicates the unfavorable utilization, but this appears still more glaringly when the loads of parcel cars are considered separately.

An interesting investigation, which was instituted on the Berg & Maerk Railroad, has shown that of 12,000 covered freight cars the average load was only 3,000 pounds. Since there are no grounds for regarding this result as exceptional, we are justified in drawing conclusions from it regarding the utilization of covered freight cars in general. Although we admit that some relief may be had by refusing to seal up freight cars which are not fully loaded, and also by premiums to the employes for the increased utilization of cars, we shall yet be able to attain an effective remedy for so small a performance of cars, and a corresponding reduction of the cost of transportation, only by a rational tariff based upon the actual cost.

If the present tariff system is tried by the measure of actual cost, and the pfennig tariff is accepted as the utmost limit, then we may accept it as a principle that every car of 22,000 pounds capacity ought to return, whatever its load may be, at least 8 cents per mile; or, in other words, that every car should be charged for according to its full capacity without reference to its load, at least when the minimum tariff is used. In this way the gross inequalities pointed out in the present tariff system, which prevent the complete utilization of the cars, would become so evident that they could no longer be maintained.

A fuller investigation would confirm the principle that the cost of transportation diminishes with the distance, a principle which is so distinctly acknowledged in England, but in Germany only in exceptional cases, and without doubt it would also enable us to discover in what proportion the cost diminishes.

The whole amount of freight carried in covered cars is not very great, but increases continually, and it is this kind of freight which has done most to complicate our system of charges, in classification as well as rates. An examination of the receipts from these freights would show that, aside from the few articles—such as grain, salt, etc.—which are carried in large quantities in covered cars, a great simplification in the other car-load rates might be made without affecting the receipts.

Although we believe that the interest of the railroads demand that the existing tariff system should undergo a thorough investigation for the sake of obtaining a rational tariff, yet we do not agree to the opinion that a uniform rate must be charged for all goods which are transported at the same cost. We believe rather that this question has been solved already in a general way, for freights shipped in open cars, by the introduction of the pfennig tariff for coal; since it is not possible to carry all car-load freights at the pfennig tariff in open cars, nor all car-load freights at the grain tariff rate in covered cars. Indeed, the prospect for further reductions in the rates for those freights whose distribution is of the greatest importance to the prosperity of the country depends upon the preservation of the higher rates for the other freights whose transportation is of less pressing importance.

Considering the number of voices, among those who are especially concerned in the freight tariffs, which have been raised recently in favor of a reform of the existing tariff system; considering the extent of the freight traffic, which in 1868 on the Prussian railroads alone produced receipts of more than $44,000,000, and which demonstrates the importance of the tariff system; considering finally the overwhelming tendency to extend more and more the reduction of rates, we believe that the time has come to subject this most important question to a general and thorough investigation on the basis of the statistical information which has been accumulated. We do not doubt that in this way the obscurity which has covered the subject of tariffs hitherto may be cleared away, and the right way be found to a reform which will be of advantage to all parties concerned.

d Proceedings of the Prussian Landtag. Report of the Committee on Commerce and Industry, March 6, 1869.—AUTHOR'S NOTE.

e In the year 1868, the amount transported of coal and coke and freight of the cheapest classes was 85.4 per cent. of the total tonnage of freight.—AUTHOR'S NOTE.

f According to the official statistics of mining industries in the Prussian nation, in the year 1868, there were obtained :

25,004,685	tons of coal of the value of.....		$28,978,782
6,162,555	" lignite " "		3,590,544
4,270,546	" ores, slates, salt, of the value of....		12,301,527
1,353,677	" cast iron " "		26,193,821
722,966	" wrought iron " "		30,394,174
134,594	" steel " "		13,304,134
172,943	" zinc, lead, copper and other metals, of the value of.....		19,522,485
Total.. 37,821,966	tons of a value of.....		$134,285,467

The Position of Rail Joints.

TO THE EDITOR OF THE RAILROAD GAZETTE:

In answer to the request of "M." in your number of 29th November, I give a word in regard to suspended joints. To begin with, the joints are the weak points of track; the nearer you can get the joint in strength and stiffness to other parts of the rail, the more perfect, and the easier it is kept up. This strength depends on the size of the splices—which, as a general thing,—I think all will admit—are too light. The weaker the joint the nearer you come to the old chair, where each rail practically had to take care of itself, and it was one of the troubles of the road-master to keep his joints up, especially in a wet time and on a "mud road." The ordinary splice has a strength not to exceed 60 per cent. of the strength of rail. Some joints with heavy outside splice are claimed to give 90 per cent. With the last, on a well ballasted road, it makes little difference where the joint is. I question if one would be able to see any difference between the two positions. With the ordinary splices I am inclined to make a tie under the joint, unless it be on a heavy stone-ballasted road, where it might be desirable to take advantage of the spring of the rail to overcome the rigidity of the road-bed. But in this case the ties should be as close as they can be tamped. With steel rail—if it be notched—the tie must be under the joint, as the notch must be at the end of the rail, if we would not have our rail break.

It is the theory of many, and I must acknowledge myself to have been among them, that with the joint between the ties we gain in elasticity, and thus prevent battering ends of rails. There are reasons for this, but it seems questionable if practice fully proves the correctness of the theory. This conclusion has been drawn from observing a well-ballasted road under a heavy traffic on both single and double track. On the double track, where rails have been laid with joints between rails, the track has moved forward four, six, and in one case, eight feet, the joints of course being on and between the ties alternately; and yet it was difficult to discover any variations in cost of maintenance under different circumstances.

The experience of others may differ, and equally with "M." I should be pleased to hear from others. X.

Some Difficult Runs.

During the great storm of December 5 some of the Michigan roads experienced much trouble from fallen trees. A train on the Grand Rapids & Indiana was obliged to cut through 100 trees between Traverse City and Clam Lake, 47 miles. On the Jackson, Lansing & Saginaw a train was 12 hours running from Otsego Lake to Wenona, 112 miles, having cut through 200 trees, one of which fell just in front of the locomotive, smashing the head-light and pilot. On the Detroit & Bay City a train cut through 300 trees in the run of 110 miles, 80 of them in 15 miles.

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Editorial Announcements.

Addresses.—*Business letters should be addressed and drafts made payable to* THE RAILROAD GAZETTE. *Communications for the attention of the Editors should be addressed* EDITOR RAILROAD GAZETTE.

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies, the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

THE RAILROAD YEAR.

The year 1873 will long be a memorable one in the history of American railroads. Aside from the panic of the last quarter of the year, largely caused by railroad operations and peculiarly fatal to new railroad enterprises, the year has other features of interest to railroads.

It has been, for instance, a year distinguished for the growth of the always more or less prevalent distrust and jealousy of railroads. This feeling was generated chiefly during the previous year probably, when an enormous production of corn in the upper Mississippi valley overstocked the market and brought down the prices so low that often it would not pay to ship it to the consumer. When the farmer makes little or no profit in his business he is very likely to suspect that the carriers are making too great profits in their business. However, there is always a strong prejudice against railroads East as well as West, and in Europe, Asia and Africa as well as America; and in this case the increased bitterness of the popular feeling has been promoted, or prevented from disappearing with its most immediate cause, by several causes. One of these is the disposition of the old political parties to fall to pieces for lack of definite and universally admitted objects, and the groping of people for new principles as the foundation of new political movements, and especially the efforts of ambitious politicians to put themselves at the head of some movement which may attract popular favor. Do their best, they cannot draw out anything like enthusiasm on old issues, which are chiefly settled, and to gain any numerous and devoted following they must bring forward some new question, or take advantage of and cultivate to the utmost such questions as the events of the day make prominent. Now we believe that, though farmers' conventions and associations are perhaps more numerous than ever, an examination of their proceedings and resolutions will show that they are neither so bitter nor so definite in their charges against railroad companies as they were a year ago. Those who have examined the subject with a little care have discovered that, however burdensome railroad charges may be to the community, railroad proprietors, on the average, do not get rich, but have to be satisfied with very moderate returns; and the blindest and most prejudiced, who refuse to examine or believe any statistics that have been collected, within the last few months have been compelled to see that a very large class of railroad investors are losing a great deal and making nothing.

But the bitterness against railroads has been formulated in legislation in many States, and is likely to have effects which will last a long time. Some of this legislation is probably wise; but some of it is contrary to natural economical laws, and can only result in the disadvantage of both the community and the corporations in case the law is observed, or in the habitual neglect of the law, which is of itself a public misfortune. Such is the principle which is aimed at in many laws, though perhaps expressed definitely in none, of seeking to compel railroad companies to make all their charges in proportion to the cost of transportation to them, and always in the same proportion, so that of every dollar received for any kind of transportation the proportion of profit would be exactly the same. The laws, to be sure, do not by any means cover the whole ground, but the intent is seen in all those which require that the rate for a given distance shall always be less than for a greater distance. This principle is embodied in the Illinois railroad law which went into effect last July, and even in the new Pennsylvania constitution, where it may do the State great evil; and there seems to be a tendency to adopt it wherever a limitation of railroad charges is aimed at.

Other important legislation of the year is the establishment of a Railroad Commissioner in Michigan, the passage of general railroad laws in New Jersey, Maine and Vermont; and among political movements concerning railroads should be mentioned the carrying of the California election by the candidates opposed to the Central Pacific Railroad, which has resulted in the choice of the leader of that opposition, Gov. Nelson Booth, to the United States Senate, with a colleague also opposed to that company. Since the last session of Congress, too, the Senate has had a Committee on Transportation travelling over the country and collecting information on the general subject; and evidently a strong effort will be made to get some laws through Congress for the purpose of regulating directly or indirectly the business of transportation.

Abroad, an experiment of peculiar interest to Americans in the new English Railway Commission, whose powers are partly judicial, and much such as Mr. Charles Francis Adams, Jr. recommended in this country three or four years ago. It has been working only two or three months, and can hardly be said to have made a record yet. One of its members must be an expert in railroad business, and this one was General Manager of a railroad when appointed; another must be a learned lawyer: so the Commission forms a sort of special court for the trial of special cases.

In this country railroad business to a very large extent onsists of railroad construction. This has been especially the case since the war, in which period of eight years we have constructed about 36,500 miles of railroad, which is a little more than half of the total mileage of the country. During the eight last years we have built as much railroad as during the preceding thirty-five, and four-fifths of this amount—two-fifths of all now completed in the country—has been built within the five years past, during which we have constructed 29,000 miles of new railroad—a work never equaled or approached in any other country. This extraordinary rate of progress reached its height in 1871 and 1872, when we reported 7,222 and 7,364 miles respectively as the work of each year. It had become evident to thoughtful men that we had been overdoing this work long before the end of last year; and by that time, or shortly thereafter, it became also evident that we could no longer continue at the same rate, though there were those who boldly predicted the construction of 8,500 miles in 1873.

In the RAILROAD GAZETTE of April 19 of this year we published an editorial on this subject, the first sentence of which was: "It is beginning to be evident that we shall not construct so many miles of railroad this year as we did last, and probably very much less." The weekly statements which we have published of the length of line constructed show that the length this year is just about one-half of the mileage constructed last year. We report to-day 3,606 miles, and this will probably be increased by one or two hundred miles by work not yet completed or not reported. This is less than we have constructed since 1868, but more than the mileage of any previous year, and doubtless more rather than less than the country needed. It is an increase of about 5 per cent. o the mileage at the end of 1872, while the increase was 12 per cent. in 1869, 13 per cent. in 1870, 13½ per cent. in 1871, and 12¼ per cent. in 1872. This decrease can hardly be charged to the panic, but rather to the causes of the panic. The panic came too late to effect this year's work very largely; it will have more effect on construction next year. We showed last August that the work done at that time was not much more than half as great as the work completed by that date in 1872. Doubtless the increase in mileage is quite as great as the increase in traffic, though it is not in all cases coincident with such increase of traffic; but there has been an immense increase in capacity for traffic this year where there is no increase in mileage, and this is one of the characteristic features of this year's construction; that is, the important improvements of many old railroad lines which form great arteries of traffic and are crowded with business. These improvements we believe to be the most important railroad work of the year, and only regret that they have not been more extensive and complete. The third and fourth tracks of the New York Central & Hudson River and the Pennsylvania, the second tracks of the Erie, the Pittsburgh, Fort Wayne & Chicago, the Lake Shore & Michigan Southern and the Michigan Central, all of which have been begun, while some are near completion, will be of enormous advantage to the country, and if the financial difficulty shall delay their completion, it is very much to be lamented on that one account. The change of gauge of the Grand Trunk is an analogous improvement, and an important one, as are the completed bridges over the Niagara at Buffala, and over the Mississippi at Louisiana, as also the approaching completion of the great St. Louis bridge, and, more than any, the opening of the Hoosac Tunnel.

We hardly need speak of the numerous failures of railroad companies, which were not infrequent in the first half of the year, and lately have been very numerous. These are mostly of new companies, and quite commonly result from inability to sell securities to meet the cost of extensions and improvements which have been paid for, or partly paid for, out of net earnings. But several roads which have been in operation over several years, and were supposed to have reached a secure position, have also failed to meet their engagements. Doubtless we shall have to announce more of them soon, as their coupons become due.

The work of the year in transportation on the whole has not been unsatisfactory, so far as we have any returns. The earnings of the nineteen roads reported in our columns last week for the eleven months ending with November were not only large in the aggregate, but a little larger per mile than for the same months of 1872. The figures per mile are $8,660 in 1873 against $8,533 in 1872, the increase being 1½ per cent. There has been great unevenness in earnings, however, some old and well established lines showing a large decrease and some a large increase. The business of most roads carrying agricultural products is now large and promises to continue to be so.

The consolidations and leases of railroad companies have been fewer, we think, than for many years previous. The lease of the Cleveland, Columbus, Cincinnati & Indianapolis to the Atlantic & Great Western and that of the Northern Central to the Pennsylvania are perhaps the most important. The Chicago, Burlington & Quincy began to work the Burlington & Missouri River at the beginning of the year; the Wisconsin Central has leased the Milwaukee & Northern and has since made some combination with the Milwaukee & St. Paul. The Vermont Central lines have been turned over to a new corporation which acts as Receiver, and there have been, as usual, many leases of branch lines to the roads with which they connect.

There have been, perhaps, no great changes in the operation and management of railroads during the year; such changes can hardly be made otherwise than slowly; but there has been manifest a disposition towards reform greater, we think, than ever before. This has been largely cultivated by the various associations of railroad officers, which, even when they do not effect anything directly, at least cultivate the feeling that improvement is a duty and perseverance in bad practices a disgrace. One really notable reform, which the Chicago railroad managements have the credit of introducing, and which we had done something towards ourselves by earnest advocacy for a year or more before, is the abolition of free passes on nearly all the most important Western roads—a reform which is almost sure to spread. Another reform which has been attempted in good earnest, and which will soon be carried out if one or two important lines do not prevent it by refusing their cooperation, is the abolition of the payment of commissions on ticket sales, a practice which takes away several millions from the railroads yearly and gives neither them nor their customers anything in return.

There has been, probably, less than the average of reckless competition; but for about three months after the 1st of August freight rates westward from New York were "cut" wretchedly, and the income from this traffic during the busiest season of the year was probably not one-half of what it should have been.

The first part of the year was notable for the extraordinary number of train accidents, traceable to the severity of the winter; but there seems to have been unusual freedom from such accidents in the last quarter, so that the average is perhaps not more unfavorable than usual—which is saying little enough. Our record for the year ending with November last showed 1,315 train accidents, by which 302 persons were killed and 1,262 injured. The most serious accidents were the one at Richmond Switch, R. I., where a

train ran into a stream, the bridge having been washed away by a dam breaking loose; and the terrible butting collision near Lemont, Ill., the direct result of disobedience of orders.

The year ends with the stagnation of certain kinds of traffic caused by the panic, a necessary but most uneconomical economy in repairs and improvements caused by the great difficulty in obtaining money, almost a total cessation of work on new lines except the finishing of contracts let, a failure to pay the interest on bonds of the newer lines so common as to make it next to impossible to borrow more money for similar enterprises, and, we think, a disposition to make economical reforms such as could hardly have appeared in more prosperous times. There is a large amount—on the whole, probably, an unusually large amount—of work in the country for the railroads to do during the coming year, and there is little prospect that there will be any considerable addition to the mileage which must do it. However, many of the new lines will have hardly got to work fairly before next year, and many lines will doubtless find their business seriously disturbed by the competition of their new neighbors, which, not getting enough to support themselves, may in some cases easily get enough to take away the support of their older neighbors.

THE PATHOLOGY OF ASSOCIATIONS.

It is said that before Americans undertake to do anything in which more than two or three persons are engaged, they almost invariably first appoint a President, Secretary and Treasurer. The capacity for organization which is so marked a characteristic, although sometimes amusing, is, as De Tocqueville pointed out many years ago, in his excellent book on this country, a very important element in our democratic government, and has done much to develop the resources of this country. The influence or rather the results of this capacity for organized effort, are seen in the facility with which railroad companies are formed, the work projected and constructed, and the roads operated. The officers and men all fall into their places quite naturally, and although in many cases the management of the affairs of such corporations is open to criticism, yet the power of organizing and of working under the organization is none the less marked. This capacity for uniting is found in nearly all classes of our people, and almost all trades, professions, arts and sciences have their associations intended "to advance the interests" of those thus united. Our readers are nearly all familiar with the societies which have been formed to discuss and consider the various branches of "railroading." The Master Mechanics' and the Car Builders' associations, The Railway Association of America, the Eastern Railroad Association, the Ticket and Freight Agents' associations, the Civil Engineers' Society, the Civil Engineers' Club of the Northwest, the Brotherhood of Locomotive Engineers, and the Conductors' Association. Now all of these have some object, more or less definite, in view. It is true that it happens often that the object is not one of sufficient importance to require a society to accomplish what is aimed at, and frequently the work which is undertaken by such organizations could be much better done by individuals alone. It is not unusual, however, to find associations that have no distinct object, and when the members meet together they have nothing to do. Such societies fortunately are usually very short-lived. In fact, if we study the history and condition of associations, we find that they are subject to disorders analogous to the diseases of the human body. They grow feeble from want of nutrition; they become excited and foolish from stimulants, and feverish and imbecile from poison in their system; too much exclusiveness has the same effect on societies as the want of fresh air on individuals; it prevents them from digesting the ordinary food which the world provides; and unless an association is careful to keep itself pure, it will breed disease, just as material dirt and filth develop pestilence.

We have been led into this train of thought by reflecting on the future of several of the associations which have been organized to increase our knowledge of the art of operating railroads. Some of these societies, notably the Master Mechanics', the Car Builders', and the Railway Association of America, have a future before them which, it might be said, "is ready made" for them. Take the first: the preamble to its constitution says it is organized to "exchange information upon the many important questions connected with our business." Now although this statement of its object is perhaps not so broad as it might be, nor so comprehensive as it would be made if those who framed the first constitution were to rewrite it, yet it indicates with sufficient precision the objects aimed at by those who founded it. This object has, we believe, been very distinctly kept in view thus far in its history; and the end aimed at has been accomplished, although perhaps not so fully as might have been possible; yet its annual reports show that it has done more good work than any other similar organization. Its membership is made up of practical and experienced men, who are more accustomed to doing things than they are to talking about them, and there are only a few who are gifted with that fatal malady—the curse of all similar bodies—"the love of hearing themselves talk." The practical result is, that when a subject comes up for consideration, there are very few words wasted upon collateral topics. Often, however, the men who know most say least, and, to return to our pathological figure again, if it were possible to administer some stimulant or tonic it might perhaps enable the body to throw off its sluggishness, which unfortunately is sometimes fatal to anything like a full consideration of the subjects which come up for discussion. Such a tonic was administered with excellent effect at the last meeting of the Car Builders' Association. The discussion of the proper size of axle for the universal standard for cars had been continued in a very animated way for a long time among comparatively a few of the members who took part. At last it was determined to call out each member present, by calling the roll, and requesting each one to state his preference and his reasons therefor. The result was that many who had been silent before expressed their views clearly and forcibly; and after thus breaking the ice of their reserve they were heard from again on other subjects. A similar plan might be pursued if each committee which makes a report should end it with a resolution, embodying its conclusions on the subject investigated, and if when these resolutions come up, the roll of members should be called with the request that each person should give his reasons for voting as he does. The time of each could be limited if necessary, but past experience indicates that this would hardly be necessary.

There is another disease—to assume our diagnosis—to which both the Master Mechanics' and Master Car-Builders' associations are liable. We refer to a want of nutrition. The food which these societies need is the earnest co-operation of their members. We have repeatedly pointed out that there is nothing which will be so certainly fatal to their prosperity as the neglect of members. No matter how skillfully a mill is constructed, it is useless if there is no grain brought to grind. We believe the shortcomings of members in this respect are due as much to over modesty as to any other cause. If such and all others could only be induced to send the best grain they have to the public mill, the annual reports would furnish much more and better food than they now do.

We have before spoken of the advantage, especially to young men, of doing something creditable at the annual meetings of these associations. We know of two men who within the past year have secured leading and lucrative positions as superintendents of machinery on important lines of road from the reputation they made and the ability they showed at the Master Mechanics' conventions. We know of a President of one of the most important railroads in the country who sent a person in whom he had confidence to the last annual convention of the Master Mechanics' Association to select a person for Superintendent of Motive Power of his road. Young men who have their reputations and positions to make would therefore do well not to disregard the opportunities which the annual conventions of the different associations offer of making themselves known. Of course if this object was made the sole and only one, and became apparent, it would defeat the end we have indicated; but, fortunately, for that purpose it is only necessary for a man to show by the information which he contributes that he understands his business.

Both the Master Mechanics' and the Car-Builders' associations have manifested a degree of jealousy about making their organizations advertising mediums for the sale of any person's wares which will in all probability prevent their falling into that slough. It is well, however, for them to maintain the same attitude and not relax their vigilance in this respect.

Of the Railway Association of America there is but little to say, as it is not yet apparently in complete working order. The admirable method which all these associations have adopted, of seeking information by sending out circulars of inquiry, has many advantages, and has produced excellent results. It is capable of doing much more than it has thus far done, and if members will only do all in their power to reply to them, the annual reports will be all the testimony needed to the usefulness of those organizations.

To the various committees we will venture to suggest that their circulars should be out as early in the new year as possible, and also that they should be careful not to ask too much in their questions. The latter should be framed so that the nature of the reply will be obvious from the inquiry. It will be well, too, for all who have to answer these questions to have the courage to confess their ignorance. It is often a step ahead to know how little we do know, and all of us have had occasion to know that the most incorrigible asses in the world are those blockheads who do not suspect their own ignorance.

The new year—the season for making good resolutions and mending our ways—will be at hand when most of those for whom we are writing will read this. We trust that among the other good resolves those who are members of the associations we have named will make will be a determination to contribute as much information as they can to the societies of which they are members. To such and all others we wish a Happy New Year.

UNIFORMITY IN LOCOMOTIVE REPORTS.

A correspondent, referring to our editorial on this subject in the RAILROAD GAZETTE of November 22, doubts whether such reports have much value, even if they were kept accurately and in such a manner as to make intelligent comparison possible. That there are very great difficulties in keeping them so that comparisons which would be entirely fair can be made, we attempted to show in the article referred to, and our correspondent has made very clear in his letter. We think the mistake which he makes is in confusing the value of such reports if inaccurately kept with their real value if based upon some system which will indicate correctly the amount of work done by locomotives. If no report at all is kept, it would be impossible to tell if an engine wasted one-half the fuel burned, and the cases are not rare where some radical defect in a locomotive was not even suspected until the fact was indicated by the fuel report. An engine might run a long time with a defective valve-gear, and the fact not be observed, did it not show in the consumption of fuel. Careless locomotive runners have wasted great quantities of fuel, and the fact not been known until the reports showed it.

It may, however, be said that for the purposes we have indicated a comparison of the train mileage on any division of a road would be sufficient to check any defects of construction or deficiencies of performance. While this is to some extent true, it makes it quite impossible for one road or division of a road to compare the engines in use on it with those of different construction or proportions on other lines. If some practical method were adopted by which the actual work done by locomotives could be clearly shown, it would enable a master mechanic, or any one else, to compare the performance of his engines with that of those on other lines. The comparison could then be made with that of the very best engines in use, whereas at present it is difficult or impossible to do more than compare engines running over the same track with each other. We have frequently stated our belief that a very great improvement is possible in the performance of locomotives if the same kind of ability is exercised in their improvement as has been employed in perfecting marine and stationary engines. Within the last ten or twenty years, the fuel consumption of marine engines has been reduced so much that steamers with the most improved engines can, in many cases, now be employed with a profit, whereas those fitted with the old forms of machinery could only be run at a loss. The reason is that the performance of such engines has been watched by their owners, as only those who have a profit or loss at stake will watch such things. Of course the engineers who could build the most economical engines received the orders of the vessel-owners, and, therefore, they had every motive to seek the highest scientific skill and the most mature experience to aid them in building the best engines. It is quite true that comparisons of performance of marine engines are easier than of locomotive engines, because there are no grades or curves on the ocean. That fact, however, has nothing to do with the value of such reports. Because locomotive accounts are difficult to keep, or if they have no value if incorrectly kept, is no reason why they would be any less valuable if kept with care, so as to show what locomotive engines are really doing. A business man who did not keep a cash account, or know for what his money was expended, would hardly be so foolish as a railroad company which does not know what becomes of its fuel.

The subject is, we think, of sufficient importance to induce master mechanics to give careful attention to it. Of one thing they may be assured, that what is called "practical experience" will not solve the problem. It will require some downright hard thinking and considerable careful calculating and some ingenuity to provide for the difficulties which any one who gives a little careful thought to the subject, as our correspondent evidently has, will see must be provided for.

Comparative Capacity and Cost of Steamers and Railroad Equipment.

The Peninsular Oriental Steam Navigation Company, which is the greatest owner in the world of steamers engaged in commerce, has recently made a report for the year ending with September last, by which it appears that it is the proprietor of fifty sea-going vessels with an aggregate of 118,333 tons burden and 21,890 horse-power. These steamers vary in tonnage from 1,185 to 3,763 tons, and in steam-power from 110 to 600 horse-power, the average being 2,366 tons and 437 horse-power. It owns besides twelve steam tugs, with an aggregate of 1,185 tons and 430 horse-power, and three cargo and coal hulks, with an aggregate capacity of 4,417 tons. Of its merchant fleet, 29 vessels are engaged in the Mediterranean and India and China service, four in the Venice and Brindisi and Alexandria service, four in the Australian service, seven in the Hong Kong, Shanghai and Japan services, while the others were building or rebuilding or repairing.

Now for all this great fleet, which is doubtless one of the best fitted and efficient in the world, the capital account is £3,980,528, or, roughly, $20,000,000 in gold, and this includes

the real estate, docks, stores, etc., belonging to the company, so that every ton engaged in traffic represents an expenditure of $170. Now this is but little more than the average cost of the equipment of an American railroad of mixed traffic per ton of capacity (counting passenger-train cars as well as freight cars as of ten tons capacity).

An estimate made from one of the best Western roads gives $155 per ton of capacity as the cost of equipment, which is not quite a tenth less than the cost of the Peninsular & Oriental steamers, which include passage and freight accommodations and motive power, as does the "equipment" of a railroad, but also include the little (proportionally) "permanent way" a steamer line needs for its purposes, which with the Peninsular & Oriental is at the rate of $3.50 per ton. So we see that a steamer line can provide a capacity for load at a cost little greater than that of a railroad equipment of equal capacity, so that the permanent way of the railroad—its chief cost—gives it so much the disadvantage of the steamer line in respect to cost. For instance, the Western road whose equipment cost $155 per ton of carrying capacity cost altogether just about $1,000 per ton of car capacity, or $10,000 per car. And this great English steamer company, whose ships are in all the Eastern seas, and whose fame is world-wide, has, and needs, a capital no greater than that of about 400 miles of good, well-equipped American railroad, or about 125 miles of average English railroad. The capital invested in railroads in this country during the year about to close, which has been but about half of that in each of the two previous years, would yet be sufficient, doubtless, to establish five such steamer lines as the great Peninsular & Oriental.

Auction Sales of New Bonds.

On the 17th, there was offered at auction, at the New York Exchange Salesroom, $500,000 of the International Railroad Company's 8 per cent. convertible bonds indorsed by the Houston & Great Northern, and an equal amount of the Houston & Great Northern's convertible 8 per cent. bonds indorsed by the International. Of these $658,000 were sold at prices ranging from 64½ to 60 per cent. of their face, there being a coupon due February 1 next. The lots sold were as follows: $10,000 at 64½; $5,000 at 63½; $5,000 at 62½; $5,000 at $61½; $217,000 at 61; $5,000 at 60¾; $30,000 at 60½; $381,000 at 60. The proceeds of the $658,000 of bonds were thus only $397,982.50, or about 60¼ per cent. on the average. Thus the 8 per cent. interest on the face of the bonds is equivalent to 13 1-5 per cent. on the money received for them. The value of the coupon attached, which was due in 1½ months, could hardly be counted less than $2.75, so that it would be more proper to count the average selling price of the bonds proper at $57.75 than at $60.50, at which former price the interest would be 13⅞ per cent., very nearly. Then the bonds must be redeemed at par, of course, when they become due, and probably (perhaps we should say possibly) in a currency equal to gold, while the money received for them last week was worth one-ninth or one-eighth less than gold, and the gold value of the price was but about $510 per $1,000 bond.

This is a hard bargain to make for money, but it was necessary to have money, perhaps chiefly on account of the failure of the State of Texas to pay the subsidy it had agreed to give, and which the courts say it must pay. The company took measures to have the burden come as lightly as possible upon the shareholders by giving them special information concerning the bonds and the manner of their sale, with the expectation that they would be the chief or sole purchasers, as they probably were. They seemed inclined, however, to drive a hard bargain with themselves. Investments made at this rate, should no misfortune happen to the road, which has a promising future, ought to satisfy a greedy man even. Ten thousand dollars so invested will return an annual income of $1,320 a year, and a principal of $16,600 when the bond is paid.

The special purpose for which money is needed just now, aside from the payment of the coupons nearly due, are the payment of the cost of 23 miles of new road west of the Brazos River, required by the charter to be completed in February next, and to reconstruct the Houston Tap & Brazoria Railroad, which was bought some time ago to give a Gulf outlet to the system of the International & Great Northern.

The completion of an outlet to the North by way of the Cairo & Fulton is reasonably expected to give a great impulse to traffic over these roads, which will then have a practicable connection with the other railroads of the United States, which up to this time they have not had.

Record of New Railroad Construction.

This number of the RAILROAD GAZETTE has information of the laying of track on new railroads as follows: *Portsmouth & Dover.*—Completed from Portsmouth northwestward 13 miles to Dover, N. H. *Wilmington & Reading.*—The *Reading Extension* has been completed by the laying of 6 miles of track westward into Reading, Pa. *Texas & Pacific.*—The *Jefferson Division* has been completed by the laying of track from Moore's Landing, Tex., north by east 14 miles to Texarkana, on the Arkansas border; the *Transcontinental Division* has been extended from Honey Grove, Texas, eastward 7 miles. *Utah Northern.*—Track laid from Ogden, Utah, northward 10 miles. *Northern Pacific.*—The *Pacific Division* has been extended from Tenino, Wash. T., northward 50 miles to the Puget Sound terminus at Tacoma.

This is a total of 100 miles of new railroad, making in all 3,606¼ miles completed in the United States in 1873.

KANSAS for the four or five years previous to 1872 was the scene of great activity in railroad construction, and it seemed at one time that all the capitalists in the country were convinced that if they could only get their money into a Kansas railroad their fortunes would be doubled or trebled. This was largely owing to government subsidies and land grants, which every railroad in Kansas except two or three has had the benefit of, and in a less degree to a sort of Kansas immigration fever which seemed to turn towards Kansas the greater part of that great and constant tide of searchers for new homes which is one of the most remarkable features of this country, and which not infrequently favors one special section for a year or a few years, and then turns to some other. However this may be, Eastern Kansas, while still mostly unfenced and very thinly peopled, had railroads enough to carry off the produce of the most populous agricultural district in America. No less than ten lines, of greater or less length, extend from its eastern border westward, and three lines extend from its central line southward across its southern half, with some branches. Now, of these lines, the following have found themselves unable to pay the interest on their bonds:

St. Joseph & Denver City.
Atchison & Nebraska.
Central Branch Union Pacific.
Atchison, Topeka & Santa Fe.
Kansas Pacific.
St. Louis, Lawrence & Denver.
Leavenworth, Lawrence & Galveston.
Missouri River, Fort Scott & Gulf.

Leaving the Kansas Central and the Missouri, Kansas & Texas (which has made no default on the bonds of its Kansas lines, we believe), with one or two short lines, as the sole railroads in Kansas which have not failed to meet their engagements, and the Kansas Central has no bonds to default on. Only two or three of these lines are badly placed; they were simply born too soon, or perhaps we should say too many of them in a litter: there was not nourishment enough for them all, and the penalty is starvation. There is generally a feeling that the projectors of a railroad are fully justified if their road ever becomes profitable—a feeling which would not exist if a larger part of the community had put money in these new lines.

But whenever it is easy to get money the temptation to build railroads becomes almost irresistible: the community wants them, because it may gain enormously and has nothing to lose; contractors, who often are the leading spirits in new railroad organizations, want them, because they make money by constructing them, and railroad investors fear lest some one else may take advantage of what may some time be a favorable place for a profitable line, and so they take time by the forelock, and so near the extreme tip of that forelock that they lose their hold altogether, and the rewards, when there are any, go to other men. It is quite as much a mistake to construct a railroad before its time as to cut grain before it is ripe; and because three cows grow fat in a pasture, we are not justified in turning a whole herd into the same field, at least not before it is better stocked with grass.

THE PROPORTION OF WORKING EXPENSES TO RECEIPTS is often put forward as evidence of the cheapness or dearness with which a line is worked; while in fact it proves nothing at all either one way or the other. Recently a statement of the proportion of expenses on the Denver & Rio Grande Railway has been widely published at home and abroad as evidence of the cheapness of working a narrow-gauge line, the per centage given in the case before us being 48¼ per cent. in August, and 45.4 per cent. in September last. The proportion of expenses depend equally on two things: 1. The *cost* of transportation, and, 2, the *rates* received. Evidently, if it costs me two cents per mile to carry passengers and I get three cents for it, my working expenses will be 66⅔ per cent.; while if I receive 4 cents per mile these same working expenses will be but 50 per cent. On the Denver & Rio Grande, we understand, *ten dollars* is charged for carrring a passenger 76 miles, and at this rate working expenses of 45 per cent. give nearly six cents per mile as the *cost* of doing the work. This is no argument against the road and its management, for the traffic is light, and heavy charges would be necessary to support a road of any gauge. The Central Pacific, whose charges are not half so high, is worked for 40 per cent of its earnings, its rates being still higher than those of most American roads with equal traffic. The Panama Railroad is worked for about 44 per cent., we believe, and one might think it wonderfully economical; but its charge for carrying a passenger 47 miles is *twenty-five dollars*, so the cost would appear to be be something like 23 cents per mile.

THIRTY MILES OF SIDINGS are said to be laid at the single English railroad station of Crewe, where yet the pressure of trains is such that no less than twenty-three trains have had to wait in order to let an express through. In order to provide additional facilities for the growing traffic, there as here almost constant expenditures of new capital are necessary. The average cost per mile of the British railroads has increased from £33,000 in 1862 to £36,000 in 1873, and the additional £3,000, or $15,000, per mile represents almost entirely improvements of the road and additions to equipment demanded by the increase of traffic, which is still too great for the capacity of the lines. Separate lines for passenger and freight traffic are now seriously considered.

The Master Car Builders' Monthly Meeting.

We are indebted to Mr. James Gillet, Editor of the *National Car Builder*, for a report of this meeting, from which the following meagre abstract was made:

The regular monthly meeting was held at the rooms of the Association, on Thursday evening, December 18. The following car builders were present: I. W. Van Houten, Joseph Jones, L. Garey, J. T. Leighton, M. C. Andrews, George Hackett, D. Hoit, G. W. Demarest, D. H. Baker, C. A. Smith, C. E. Garey, G. W. Bitner, Ellis Dodge, E. Lockwood, E. A. Olmstead, C. J. Holbach, Willis Davis, H. S. Billings, B. D. Phelps, and a number of other gentlemen interested in the objects of the Association.

CAR VENTILATION.

The subject for discussion was the heating, lighting and ventilating of cars.

Mr. Andrews inquired whether any experiments had been made in the way of exhausting the air at the bottom of cars and taking it in at the top.

Mr. W. G. Creamer, of New York, said the top or dome of a car was the very worst place to admit air, as the steam and smoke were admitted with it. The impure air should always be let out at the top and the supply introduced at the sides, over the windows or at the frieze.

Mr. Leighton said the essential thing was to get the impure air out and the other kind in. Foul air in cars proceeded mostly from respiration; and this, he contended, as well as the air burnt by contact with overheated stoves, fell to the bottom.

Mr. Bitner said the theory was correct as regards buildings, but it did not apply to cars; at least not to the same extent. Cars moved rapidly; buildings did not.

Mr. Leighton replied that if the impure air in a house falls to the floor and passes out through the exhaust ventilation at the bottom, he could not see why it should not be the same with cars.

Mr. Creamer could not admit the premise assumed that the bad air was next the floor.

Mr. W. E. Partridge thought both theories were partly wrong and partly right. Air exaled from the lungs rises because it is warm, and in a church the mass of carbonic acid exaled by the congregation rises to the roof, from which it falls while the building is shut up during the week.

Mr. M. N. Forney spoke of an attempt made by the elder Mr. Winans of Baltimore, to ventilate a ballroom. In order to ascertain more correctly the atmospheric conditions he had to deal with, a number of toy balloons were introduced into the room to show the effect the ventilating arrangements would have upon them, and their movements were so peculiar that, in the words of Mr. Winans, "no living man could understand them." It was very doubtful whether any product of respiration would rise or fall against an opposite current. There was also a strong affinity between gases of different densities, causing them to unite. It was not very material whether the supply of air came from the top or bottom of a car, so it was distributed through the whole interior. He once took the trouble to test with a thermometer the difference in the temperature of the air at the top and bottom of a car in winter. The car was heated in the ordinary way, and had exhaust ventilators open at the top, and the difference was 42°. The outside temperature, however, was not far from zero.

Mr. Leighton inquired which was the purest, the air at the top or bottom?

Mr. Forney replied that that was a conundrum he would not undertake to solve.

The discussion was continued in a desultory way for some time longer, but without eliciting any new points or reaching any conclusion, when Mr. Forney moved that Prof. L. W. Leeds, who had given special attention to the subject of ventilation, be invited to address the Association at its next monthly meeting. The motion was agreed to. Mr. Leeds has since accepted the invitation, and an interesting address may be expected from him at the next meeting.

LIGHT FREIGHT CARS.

Mr. Forney said that a prominent railroad man had recently suggested to him the importance of some inquiry into the practicability of such a construction of freight cars as would reduce their weight below that of the present standard without impairing their capacity for service, and whether ordinary rolled iron in the form of channel I beams could not be advantageously used in framing.

Mr. Van Houten said he did not believe an iron freight car ever would be made that would be of any advantage to a railway company. There were numerous objections to them; they were not as durable as wooden cars, they were more difficult to repair, and in case of injury in a wreck they could not be restored without virtually making a new car. He thought, however, the weight of wooden cars might be considerably reduced. Many years ago the Pennsylvania Railroad had an attack of the "light-car" fever, and the shops were set to work to construct the best car of this description that could be designed. As there was naturally a little rivalry between the shops, he did the best he could and produced a car which weighed only 14,300 pounds. It was 28 feet long, 8 feet 6 inches wide, and six feet high from floor to plate, in the clear. The trucks were particularly light. The car ran eight years, and required no more than ordinary repairing.

Mr. Leighton thought, in spite of all theories to the contrary, that iron cars were a good deal heavier than wood.

Mr. Creamer referred to some first and second-class cars which came under his notice several years ago on the Northern Railway, in France. They were framed of wood, but the paneling was of sheet iron and of superior workmanship.

Mr. Smith favored light cars. They were better in a smash-up, he believed, than heavy ones; but even if they were somewhat more liable to injury on such occasions, it was better than to haul the dead weight—better, even if you wear them out two to one, because they saved the track, motive power, etc. He had built a car which had now been running on the Erie road a year without needing any repairs. It was 29 feet long, 8 feet 8 inches wide, and weighed 17,700 pounds; had heavy axles and 500-pound wheels, and was of course broad gauge. The result for a standard-gauge car, built on the same principle, would be still more favorable. As respects iron cars, the time was not distant when they would come into use as a matter of necessity if not economy. Our timber was failing, but our iron mines were inexhaustible. We must, however, get up a car of this kind that will as far as possible obviate all objections.

Mr. Bitner thought a car might be built that would not weigh over 17,000 pounds, and be just as good as any we have now weighing 21,000. He also favored iron cars. They had not yet been fairly tried, but the day was coming when they would be used and appreciated.

Mr. J. Whiteford, of Chicago, exhibited an automatic car-coupler which he has introduced on several Western roads. It is simple in construction and can be made at a moderate cost.

The meeting then adjourned. The next meeting will be held on the 15th of January.

Dividends.

The United New Jersey Railroad & Canal Company pays the guaranteed quarterly dividend of 2½ per cent. January 10, at the Pennsylvania Railroad Company's offices, No. 57 Broadway, New York, and No. 233 South Fourth street, Philadelphia. Transfer books were closed on the 20th, and will be reopened January 12.

The Rome, Watertown & Ogdensburg Company will pay a half-yearly dividend of 3½ per cent. January 15. Transfer books will be closed from December 27 till the 15th of January.

The Philadelphia & Reading will pay the usual half-yearly dividend of 5 per cent. on its common and preferred stock, at Philadelphia, January 26. Transfer books will be closed from January 1 to the 13th.

The Illinois Central has declared a dividend of 4 per cent. on all full paid shares, payable February 2. The transfer books will be closed from January 15 to February 2. Heretofore, for ten years past, the half-yearly dividends have been 5 per cent.

The Iowa Falls & Sioux City Company (whose road is leased to the Illinois Central) will pay $3 per share at the office in Boston, January 1.

General Railroad News.

CHICAGO RAILROAD NEWS.

Michigan Central.

In view of the improved condition of the Great Western and the new double track laid during the season on that line, this company expects to carry a much larger quantity of freight than was possible last winter. A second ferry slip has been built on each side of the river at Detroit, and a new ferry boat carrying 10 cars has been built, while a second boat to carry 18 cars will be ready in January. This will make five boats in all on the transfer at Detroit. Moreover, Michigan Central cars can now run over the Grand Trunk and the Canada Southern to Buffalo, as well as over the Great Western.

The Detroit Bridge has bright prospects of being commenced before a great while, the Canadian Parliament having done its part in granting a permit for its construction. It is understood also, that the Commission appointed last summer by the Secretary of War to report upon the feasibility of the bridge, and whether or not it would be an impediment to navigation sufficient to prohibit its construction, have decided upon their report, and that it is favorable to the construction of the bridge.

Illinois Central.

This company, like the Chicago & Alton, intends to issue round-trip tickets at reduced rates from all stations on the line. A second reduction in the wages of train hands has been made on account of the unsatisfactory condition of the freight tariff and business. It is stated that wages will be still further decreased unless the business of the road improves.

Chicago & Alton.

This company will hereafter issue round-trip tickets at reduced rates to Chicago from all stations on the line, including East St. Louis. The object is to stimulate local traffic.

Chicago, Burlington & Quincy.

The reports that the enginemen on this road were about to strike on account of a proposed reduction of pay are pronounced false. No reduction of pay is intended, and there is no talk of a strike.

Passes.

The pass system seems to have been very nearly killed off by recent action of the railroad companies centering in Chicago. The Western and Southern roads have practically discarded the system, root and branch, and the roads running eastward from this city have taken a long step in the same direction, in agreeing as they did, December 16, not to ask for a greater number than five exchange passes with any of the railroads West, North and South of Chicago. The General Superintendent of the Michigan Central road has issued a circular asking for but four exchange season passes on other roads.

Illinois Central.

Owing to delays caused by the unexpected rise in the river at Cairo, some hindrance has been caused in the completion of the arrangements for the establishment of a through train between this city and New Orleans. It is fully expected that the trains will be started by New Year's day.

The company has decided to reduce the hours of labor to eight hours in the shops after January 1, and also to reduce the number of employees to some extent.

Milwaukee & St. Paul.

A new train has been put upon the Milwaukee & Northern road, leaving Milwaukee at 9:30 p. m. This train connects with the train which leaves Chicago on the Milwaukee & St. Paul road at 5 p. m., thus making a through train from Chicago to Green Bay. The arrangement went into effect December 21.

ELECTIONS AND APPOINTMENTS.

—The annual meeting of the Wheeling & Lake Erie Railroad Company was held at Martin's Ferry, O., December 16, and the following directors were elected: Joel Wood, T. W. Chapman, Simon Beiter, Joseph Bell and R. H. Cochran, for the term of three years; Nathan Hussey, Cyrus McNeely, Edward Otis and F. G. Lockwood, for two years; T. J. Roby, H. W. Hendry, Henry Ainsworth and James Kerr for one year. Joel Wood was re-elected President.

—At a meeting of the board of directors of the Syracuse Northern Railroad Company, December 16, Mr. R. De Witt Mann was chosen Secretary, in place of P. H. Agan, resigned. Mr. Mann has been Cashier and General Freight Agent for two years past.

—At a meeting of the directors of the Richmond & Petersburg Railroad Company, December 16, Mr. Reuben Ragland resigned his position as President of the company, and Frederick P. Scott was chosen President *pro tem.*

—The directors of the Shenandoah & Ohio Railroad Company are: B. B. Thomas, E. Border, Charles Lening, John Donaldson, Howard B. French, R. C. Thomas, all of Philadelphia; General S. G. French, H. M. Clay and R. N. Pool.

—Mr. Caleb Hose has been appointed Superintendent of the Northern Division of the New York & Oswego Midland Railroad, in place of W. P. McKinley, resigned.

—The directors of the Hannibal & Naples Railroad Company have re-elected C. M. Smith, of Springfield, Ill., President, and W. B. Corneau, Secretary and Treasurer.

—The annual meeting of the Little Rock & Fort Smith Railroad Company was held in Little Rock, Ark., December 15. An injunction was presented restraining the commissioners of election from receiving the votes of certain Boston stockholders. The following directors were then elected: Anderson Gordon, Solomon F. Clarke, John C. Peay, John D. Adams, Kirkbride Potts, Matthew F. Locke, Benj. F. Danley, Nathaniel S. Howe, Jordan E. Cravens.

A part of the stockholders, refusing to obey the injunction, withdrew and held a separate election, choosing the following directors: Elisha Atkins, N. S. Howe, D. B. Sickles, Thomas M. Bowen, T. D. W. Yonley, O. A. Hadley, John Stoddard, Henry Page, W. S. Oliver. A meeting of these directors was then held, and the following officers were elected: Thomas M. Brown, President; Henry M. Cooper, Secretary; John Stoddard, Treasurer; T. D. W. Yonley, Attorney. Mr. Howe subsequently declined to serve, and Hon. A. McDonald also declined to serve as President or director.

—At the adjourned annual meeting of the Chesapeake & Ohio Railroad Company in Richmond, Va., December 18, the old board of directors was re-elected, as follows: William H. Aspinwall, J. G. Clark, William B. Hatch, C. P. Huntington, A. A. Low, David Stewart, W. Whitewright, Jr., New York; John Echols, William C. Wickham, Richmond, Va.; H. C. Parsons, of West Virginia; Pliny Fisk, of New Jersey.

—At the annual meeting of the Western Railroad Company of Alabama recently, the old board of directors was re-elected, as follows: Josiah Morris, C. T. Pollard, Montgomery, Ala.; W. B. Berry, Newnan, Ga.; W. S. Holt, Macon, Ga.; John P. King, Augusta, Ga.; W. M. Wadley, Savannah, Ga.; H. B. Plant, New York. The board re-elected the old officers, as follows: C. T. Pollard, President; C. P. Ball, Superintendent; J. T. Todd, Secretary and Treasurer; S. D. Hubbard, Auditor.

—Mr. James Steele, of Paris, Edgar County, Ill., has been appointed Railroad and Warehouse Commissioner of Illinois to succeed Col. H. D. Cook, deceased. Mr. Steele has been for several years past and until last fall Judge of the Circuit Court of his Circuit.

—Mr. F. E. Hinckley, Receiver of the Gilman, Clinton & Springfield road has made the following additional appointments: D. H. Conklin, late Train Despatcher at Aurora, on the Chicago, Burlington & Quincy, Master of Transportation; T. J. Hudson, General Freight Agent; A. Pickard, General Ticket Agent and Auditor; W. B. McKenna, Master Mechanic.

— At the annual meeting of the Galena & Southern Wisconsin Railroad Company, December 2, James M. Ryan, George R. Melvill, M. Y. Johnson, Richard Barrett and Edward Harding were chosen directors. The board elected James M. Ryan, President; Richard Barrett, Vice-President; W. H. Snyder, Treasurer; R. Brand, Secretary, and Edward Harding, Chief Engineer.

—Mr. James A. Tappan, Chief Engineer, has been appointed Superintendent of the Arkansas Central Railway in place of George H. Bristol, deceased. Mr. Tappan is now Superintendent and Chief Engineer, with office at Helena, Ark.

TRAFFIC AND EARNINGS.

—The earnings of the Chicago & Northwestern Railway for the second week in December were: 1873, $214,701; 1872, $211,168; increase, $3,533, or 1⅝ per cent.

—The earnings of the Kansas Pacific Railway for the first week in December were: passengers, $18,841.77; freight, $28,921.62; mails, $2,055.31; total, $49,818.70. Of this amount, $2,313.39 was for transportation of troops, mails and government freight.

—During nine days ending on the morning of December 16, 6,632 loaded cars passed eastward through Port Jervis on the Erie Railway, an average of 737 cars per day.

—The earnings of the Great Western Railway of Canada for the week ending November 28 were: 1873, £20,257; 1872, £25,315; decrease, £5,058, or 20 per cent.

—The earnings of the Grand Trunk Railway of Canada for the week ending November 29 were: 1873, £44,700; 1872, £38,200; increase, £6,500, or 17 per cent.

—Receipts of the Rockford, Rock Island & St. Louis Railroad for the month of August were $77,822.20, and the working expenses, rents and taxes $60,101.76, leaving $17,720.44 as net earnings. For the two months ending with August the gross receipts were $130,839.17 and the net earnings $22,242.81.

—The earnings of the Indianapolis, Bloomington & Western Railway for the month of November were: 1873, $112,974; 1872, $102,431; increase, $10,543, or 10¼ per cent.

—The earnings of the Chicago, Danville & Vincennes Railroad for the month of November were: 1873, $64,230; 1872, $55,000; increase, $9,230, or 16¾ per cent.

PERSONAL.

—Mr. Chester W. Chapin, President of the Boston & Albany Railroad Company, passed his 75th birthday December 16. Mr. Chapin is still a vigorous worker and enjoys excellent health.

—Mr. James McGee, Master Car Builder of the Pittsburgh, Cincinnati & St. Louis Railway, has sent in his resignation, to take effect January 1. Mr. McGee has been in the employ of the company for 12 years, serving successively as mechanic, General Foreman of the Steubenville shops and Master Car Builder.

—Mr. J. P. Irwin, Road Master of the Warren & Venango Division of the Dunkirk, Allegheny Valley & Pittsburgh Railroad, was presented recently with a handsome gold watch and chain by the men under his charge.

THE SCRAP HEAP.

Railroad Manufactures.

The Jackson & Sharp Manufacturing Company, at Wilmington, Del., has lately received orders for 10 passenger and 30 freight cars for a narrow-gauge road in South America.

The Harlan & Hollingsworth Company, at Wilmington, Del., has little or no work on hand in the car department.

Bowers, Dure & Co., at Wilmington, Del., are filling an order for passenger cars for the North Pennsylvania Railroad.

The Co-operative Car Works, at Oxford, Pa., have received orders for cars for a Western road.

A proposition is under consideration for removing the Richards Iron Works from Chicago to Joliet, Ill., and fitting up at the latter place a locomotive shop.

About 100 additional men have been discharged from the Rogers Locomotive Works, at Paterson, N. J., leaving only 275 at work, the usual force being about 1,700.

Checking Baggage in Ireland.

In introducing the American system of checking baggage for the Midland Great Western Railway of Ireland, Mr. J. E. Ward, the Traffic Superintendent, adopted also the American duplex ticket for excess baggage.

An Opportunity for Car-Couplers.

An exchange says: "Judge Rowe, of Norridgewock, Me., a director and Treasurer of the Somerset Railroad Company, tried his hand at coupling freight cars the other day, and got a broken arm and several broken ribs."

Probably anyone who wishes to introduce a patent car-coupler can now secure a hearing from the Somerset Railroad Company without difficulty.

A Patent Ticket Indicator.

A novel apparatus has just been patented which is intended to receive the tickets and conductors' checks of railroad passengers, indicate the destination of each traveller while he is in the car, and keep a record of all the trips made, inaccessible to any trainman, or to any one except the proper agent—presumably a representative of the General Ticket Agent, at the end of the trip. For this purpose there is fastened a box with two compartments on the side of the car above each seat, there being one compartment for each passenger. When the conductor takes up a ticket, or collects a cash fare, he punches the ticket or the check which he gives for the cash fare and slips it into the mouth of the compartment which answers to the passenger's seat. The box contains a simple apparatus which conducts this ticket to a plate inclined a little from the perpendicular, on which it rests, plainly visible through the glass face, and showing the stations from and to which the passenger is entitled to ride. After being put in, it cannot be touched, and if the passenger is inclined to ride further than he has paid, the ticket over his head will show plainly and unquestionably his proper destination. When he gets out, and a new passenger takes his seat, the entering of the latter's ticket causes the former's to drop into a lower compartment, while the one last received remains in the upper. Thus at the end of the trip the upper compartment will have the ticket of the passenger who occupied the seat last and the lower one the tickets of all the other passengers who have occupied the seat since the box was last opened by the person whose business it is to collect them; and the collection of tickets so made is a substitute for the conductor's report.

One lock locks all the boxes on one side of the car, by a bar which extends from end to end and fastens all the boxes. There is to be, however, a lock at each end, so that the ticket collector, entering at either door, may unlock a lock on each side of the door and then go through the car and collect the contents of all the boxes without further difficulty.

This invention is in the hands of Mr. G. F. Thomas, Editor of *Appleton's Railway Guide*, who is about to present it to railroad companies for introduction.

OLD AND NEW ROADS.

New Jersey Midland.

Arrangements have been completed for the lease by this company of the Middletown, Unionville & Water Gap Railroad from Unionville, the terminus of the New Jersey Midland, to Middletown, N. Y. From the present time up to April 1, 1874, the New Jersey Midland is to pay $100 per day, from April 1 to October 1, 1874, $115 per day; and after October 1, 1874, 7 per cent. interest on the funded and floating debt and $500 per year for incidental expenses. The lessee agrees to pay off the floating debt after October 1, 1874, in quarterly payments, receiving in return stock of the leased company at par. The agreement still requires the assent of the stockholders, which, it is thought, will be readily given. The road is 13 miles long. The funded debt, by the last published statement was $225,000, and the floating debt about $31,000. After next October the rent will amount to $18,420, or about $1,400 per mile, gradually diminishing, as the floating debt is paid off, to $16,250, or $1,250 per mile. This does not appear an unreasonable rent, although the lessee has to pay a pretty heavy bonus at the outset.

Boston & Albany.

The new bridge over the Connecticut River at Springfield, Mass., is nearly completed, and trains pass over it. The old bridge, which has stood for twenty-eight years, is now being torn down.

Illinois, Missouri & Texas.

Work has been resumed on this road, and the company hopes to have some 30 miles of iron laid from Cape Girardeau, Mo., westward by the end of January.

Little Rock & Fort Smith.

At the annual meeting of this company, which was held in Little Rock, Ark., December 15, an injunction was served on the commissioners restraining them from receiving the votes of certain of the Boston stockholders. Two of the three commissioners announced their intention of disregarding the injunction. The Governor of Arkansas, who was present as representative of the stock held by the State, said that the injunction must be obeyed, whereupon the two commissioners and some of the stockholders withdrew and held a separate election. The Little Rock *Gazette* says that the seceders' movement was "in the interest of the speculative ring that has so long embarrassed that important work."

The road has been placed in the hands of a receiver on the application of the State Treasurer, pending the contest for its possession.

Sussex.

The arrangements with the New Jersey Midland, which has been before spoken of, amounts simply to this, that the passenger and milk trains are now run so as to make close connection with the New Jersey Midland at Franklin, as well as with the Delaware, Lackawanna & Western at Waterloo, as heretofore. Freight eastward bound will be shipped over either line as directed, thus giving passengers and freight shippers opportunity to use either route. Heretofore all eastward business has gone over the Delaware, Lackawanna & Western.

Shenandoah & Ohio.

The engineers are now locating the line from the crossing of the Valley Railroad above Harrisonburg, Va., and Franklin, West Va., a distance of 47 miles. Contracts are to be let as soon as the location is completed. The company has received large donations of land in aid of the construction of the road.

Burlington & Southwestern.

The lease of this road to Capt. E. B. Ward, of Detroit, has been filed with the Secretary of State of Missouri. The object of the lease is the completion of the road to Stanley City, and one of the conditions is the agreement of the bondholders to advance $750,000 for that end.

South Side, of Long Island.

Two petitions in bankruptcy have been filed against this company. An order to show cause why the company should not be adjudged bankrupt has been granted and the case is to come up for trial December 27.

Utah Northern.

On the extension from Brigham City southward to Ogden, track has been laid from Ogden northward 10 miles, and the work is progressing as fast as the weather will permit.

Green Bay & Minnesota.

Through trains will begin to run from Green Bay, Wis., to Winona, Minn., as soon as the track is finished up, probably by the close of the year.

Lake Ontario Shore.

The lease of this road made to Edward Crane of Boston, George T. Post and Mr. Gurley, for the Boston & Chicago Railroad Company, has been made void by the failure of the lessees to fulfill the terms of their contract.

Paris & Danville.

Mr. Short, President of this company, informs us that a contract has just been closed with the Joliet Iron Works for iron sufficient to lay the track from the present terminus at Paris, Ill., southward to Lawrenceville on the Ohio and Mississippi road, a distance of 65 miles. The grading of this extension is completed from Paris south to Hutsonville, 37 miles, and a large force is at work on the remaining section, which, it is expected, will be completed by the close of the year. The business of the company is good, and the production of its coal mines is being steadily increased. The company is also about to contract for a large increase of its equipment. The road now in operation is 36 miles long, from Danville south to Paris. Its direction is nearly due north and south.

Texas Railroad Projects.

The following companies, not heretofore noticed, were granted charters by the last Legislature of Texas:

Columbus, Austin & Parker County.
Sabine & Galveston Bay.
Sherman, Wichita & Panhandle.
Dallas, Palestine & Southeastern Texas.
Austin & Pacific Short Line.
Ledbetter & La Grange.
Lavaca County Tap.

New York & Long Branch.

Work has been commenced on the grading at Red Bank, N. J., and also at Keyport.

Berks County.

The stock heretofore held by the Wilmington & Reading Company has been transferred to the Berks County Company. At a meeting held recently in Reading, Pa., the Chief Engi-

neer, Mr. J. Dutton Steele, stated that the grading was very nearly completed from Reading to Slatington, and that little remained to be done on the track-laying. The whole amount expended on the road has been $852,678, and $225,000 is required to complete it. An effort is being made to secure the required sum.

Cairo & Fulton.

The bridge over the Arkansas at Little Rock was to be completed this week. Work at the crossing of the Red River at Fulton has been delayed by high water. When the river subsides only a very short time will be required to complete the road to Texarkana.

Illinois & St. Louis Bridge.

The connecting tubes of the two interior ribs of the central arch were put in place December 16, and those of the eastern arch December 17. It will take 10 or 15 days more to put in the tubes of the outer ribs.

Texas & Pacific.

The track on the Jefferson Division has reached Texarkana, the terminus of the division, where connection is to be made with the Cairo & Fulton. Texarkana is 75 miles from Marshall and 14 miles beyond Moore's Landing, the late terminus.

Track on the Trans-continental Division is laid 50 miles eastward from Sherman and seven miles beyond Honey Grove, the late terminus. The bridge work is completed far in advance of the track-layers.

Wilmington & Reading.

The work of track-laying on the extension from Birdsboro to Reading has been completed. The track is being finished up, and an excursion train was to run through on Christmas day. The extension is nine miles long, and enables the Wilmington & Reading trains to run through to Reading. The road has hitherto been dependent on the Philadelphia & Reading for the connection. The track through Reading, which is to connect with the Berks County road, was laid some time ago.

California & Texas Construction Company.

The Harrisburg *Patriot* states that there is no truth in the report, telegraphed from that city, a few days ago, that Colonel Thomas A. Scott had effected an arrangement with Hon. Asa Packer, President of the Lehigh Valley Railroad Company, for the means necessary to complete the construction of the Texas & Pacific Railroad.

Rochester, Nunda & Pennsylvania.

An injunction has been obtained to prevent the city officers of Rochester, N. Y., from issuing any more of the city bonds voted to this company. The amount voted was $150,000, of which $50,000 have been issued. The City Treasurer states that there was no present intention of issuing any more bonds.

Western Illinois Bridge.

This company, which proposes to build a railroad and wagon bridge over the Mississippi at Quincy, Ill., is making arrangements to issue $800,000 of bonds to furnish the means to construct the bridge, the estimated cost of which is $650,000. The company is asking subscriptions to its stock, such subscriptions to be payable in installments, 5 per cent. down and no more than 7 per cent. in any one year thereafter, and no installments to be called in unless the earnings of the bridge are insufficient to meet the interest on the bonds.

Hannibal & St. Joseph.

The contract for the coal supply for the ensuing year has been awarded to A. L. Shortridge, of Macon, Mo. The quantity required will be about 45,000 tons, and it will come from the Summit, Mo., mines.

Northern Pacific—Pacific Division.

The track is laid to Tacoma, the Puget Sound terminus, completing the connection between Puget Sound and the Columbia River. Tacoma is 115 miles from Kalama, the Columbia River terminus, and 50 miles beyond Tenino, the terminus of the road built last year.

Atchison, Topeka & Santa Fe.

This company has issued a circular to the stock and bondholders in relation to the present condition of its affairs. The floating debt is now $386,000, besides the January interest, and taxes amounting to $50,000 nearly due. The Land Department also owes $350,000, being excess of expenses over receipts. Since April 1, 113,000 acres have been sold at an average of $5.50 per acre, but nearly all the sales have been on credit while the expenses have been paid in cash.

The net earnings for the nine months ending December 31 are estimated at $425,000, and it is believed the net earnings for 1874 will reach $675,000, and for 1875 $825,000; while the interest on the first-mortgage bonds is $492,870, gold. It is believed that the receipts of the Land Department will soon be sufficient to pay the interest on the land bonds, which is $241,885, gold, per annum.

To meet the wants of the Land Department, it is proposed to issue at par $700,000, 12 per cent. currency income bonds, running five, six and seven years, to be paid for in three equal installments, January 1, 1874, July 1, 1874 and January 1, 1875, in cash or land-mortgage coupons due three months later. To provide for the other needs of the company it is proposed to issue $1,852,000 consolidated 7 per cent. gold (second mortgage) bonds at 50, the first coupon due October 1, 1876. These bonds are to be paid for in three equal installments January 1 and July 1, 1874, and January 1, 1875, in cash or coupons due three months thereafter. Each holder of 25 shares of stock will have the right until December 20, to take $500 of the consolidated bonds and $200 of the land income bonds.

Chesapeake & Ohio.

A meeting of the creditors was held recently in Baltimore. The company's affairs were freely discussed, and it was generally agreed that the holders of notes secured by 6 per cent. bonds should take the bonds held as collaterals and fund the interest, and holders of notes secured by 7 per cent. bonds should surrender the bonds and take income bonds at 85 to the amount of their notes. Mr. Huntington, President of the company, stated that a large amount of the entire debt had come into this agreement, and should it be made universal the company would be placed on a firm basis, and be enabled to go on and complete the line to Louisville. He closed by stating that $1,300,000 of the $1,600,000 required to complete the road-bed of the Louisville line was subscribed, and the 86 miles of iron needed could be paid for by bonds on that line to be issued hereafter.

A shipment of 1,000 tierces of lard from Cincinnati to Glasgow by way of this road is announced as the beginning of what promises to be a valuable through business. Since the completion of the Church Hill Tunnel the road is prepared to carry the valuable steam and gas coals of West Virginia to the Richmond docks for shipment.

Philadelphia & Reading.

The steam collier Readin , of 1,500 tons capacity, was launched December 16, from the shipyard of Cramp & Sons, Kensington, Philadelphia. The company has six of these vessels now in use, two each of 500, 800 and 1,000 tons. Eight are under construction, six of 1,500 tons, one of 1,200 and one of 600 tons. The Reading is 250½ feet long, 37 feet beam, 20¼ feet depth of hold, and draws when loaded 15 feet. She is entirely of iron, and has a direct-acting engine of 42 by 42 inches cylinder, and a screw propellor 12 feet diameter and 17½ feet pitch. The company proposes to increase its fleet to 50 vessels. They will be employed in the coal trade from Port Richmond.

Work is still going on on the Perkiomen Branch, and a section on the northern end from Emaus, Pa., southward, will shortly be completed. The whole length of the branch will be 39¼ miles, of which 23 miles from Perkiomen Junction northward to Pennsburg is in operation, leaving 16¼ miles, from Pennsburg to Emaus, to be completed.

Northern Pacific.

This company announces that it will fund all interest on its bonds up to and including January 1, 1875, into five-year, 7 per cent. coupon bonds, convertible at par into the company's first-mortgage bonds, and into the company's lands at a discount of 25 per cent, on the regular prices of said lands. There will thus be five coupons to be funded, the face value of which is $18.25 per $100 bond.

Vermont Valley.

The Vermont Chancery Court has refused to grant the injunction asked for to restrain the old board of directors from exercising any further authority. This action continues the old board in possession.

Vermont Central.

The trestle bridge at Waterbury, Vt., which was incorrectly stated to have been carried away some week ago, was carried away December 11, and trains passed over it again December 15. Mr. E. H. Hewins, Engineer of the New England Iron Company, has a contract for building an iron bridge at that point. One span was nearly all on the staging when the trestle bridge went down, but it was not carried away. This span was completed December 15, and the whole iron bridge will be up by January 1. It has three spans, each of 140 feet.

Brunswick & Albany.

The Court has granted orders distributing to the creditors most of the money received for the purchase of this road. Attorneys for Henry Clews & Co. presented a claim, as a preferred lien on the funds, for coupons held by them amounting to over $200,000, but the Court refused to allow the claim, and an appeal is to be taken to the Supreme Court.

Western Maryland.

The extension from Hagerstown to Williamsport was opened with much ceremony by an excursion over the road, December 17.

Portsmouth & Dover.

The work of track-laying on this road is completed, and the road is expected to be open for travel about January 1. The road is about 13 miles long, from Portsmouth, N. H., northeast to Dover. It is controlled by the Eastern Railroad Company.

Cayuga Lake.

It is reported that the New York Central & Hudson River Company has leased this road and has purchased the charter of the Cayuga Northern road. The Cayuga Lake road is 38 miles long from Cayuga, N. Y., on the Central's Auburn Branch, down the east shore of Cayuga Lake to Ithaca. The Cayuga Northern Company had a charter to build a line from Cayuga northeast through Port Byron, on the main line of the Central, to Lake Ontario. Through the Ithaca & Athens the Cayuga Lake road has a very direct connection with the Pennsylvania & New York road.

St. Louis & Southeastern.

It is stated that the difficulties between this company and the city of Henderson, Ky., have been arranged by a compromise, negotiated by Gen. Winslow with the Henderson Common Council. The agreement is stated to be that the St. Louis & Southeastern may build a road of 4 feet 8½ inches gauge on the Kentucky side of the Ohio River, beginning at a point opposite or nearly opposite Evansville, and striking across the peninsula to a point one mile out from the corporation limits of Henderson, where the side tracks will be located, and the break of bulk in freights be made. This line is to be constructed at once.

This will avoid the long water transfer of 11 miles between Evansville and Henderson and require only a short ferry at Evansville.

Sunbury & Lewistown.

This road is advertised to be sold in Philadelphia, May 5, 1874, under foreclosure of the first mortgage, by order of the Pennsylvania Supreme Court. The road is 42 miles long from Lewistown, Pa., on the Pennsylvania Railroad, northeast to Selinsgrove on the Philadelphia & Erie. It has been operated by the Pennsylvania Railroad Company as its Lewistown Division. From the report of the latter company it appears that the gross earnings last year were less than the operating expenses.

St. Joseph & Denver City.

The trustees of the mortgage have been requested by more than one-third, in amount, of the bondholders to foreclose the mortgage, and bills have been filed for the foreclosure of the mortgage on both divisions. It is probable that there will be no opposition.

Lehigh Coal & Navigation Company.

This company has sold all its Newport and Hanover coal land and the leases at Plymouth to the Honey Brook Coal Company of Audenreid, Carbon County, which is controlled by the New Jersey Central Company. This purchase comprises all the company's coal lands in the Wyoming region. The price paid is said to be $4,750,000. The company still retains its Lehigh coal lands and the canal property, and will, it is said, now be able to clear off its floating debt and extend its operations. The Central Company obtains by the purchase what it has long desired, the control of a large body of coal lands.

Canada Southern.

The time table of this road shows one through passenger train between Buffalo and Detroit, and one between Buffalo and St. Thomas, on the main line. On the St. Clair Branch one train runs daily between St. Thomas and Courtright. On the Toledo, Canada Southern & Detroit three trains run between Detroit and Toledo and one train runs from Detroit to Trenton Crossing and thence over the Chicago & Canada Southern to Fayette.

The company has completed arrangements for the formation of two new freight lines to run over its road. The Diamond Line will run from New York to Buffalo over the Erie and the Canada Southern Line over the New York Central & Hudson River. Both lines will run over the Michigan Central from Detroit to Chicago.

Erie Canal.

Mild weather having succeeded to the cold snap which closed the canal, strong efforts were made to get out the boats which were frozen in, with only partial success. Some 50 boats were brought through to the Hudson at Albany at a heavy expense.

Railroad Taxation in Wisconsin.

The Secretary of State of Wisconsin in his annual report states that the 3 per cent. tax on gross earnings produced last year $257,895.55. He considers this less than the amount paid by other property of equal value and suggests three plans for making a valuation of the roads for purposes of taxation: First—Take the actual cost of the roads and their equipments. Second—Add to the total indebtedness of the roads the aggregate market or quoted value of their stocks. Third—Take an amount, the interest of which, at 7 per cent. or any other assumed rate, would produce a sum equal to the net earnings.

Grand Trunk.

Speaking of the freight blockade now existing at Portland, Me., a correspondent of the Toronto (Ont.) *Globe* says: "Shippers to England are now suffering a fatal delay in transhipment of freight via Grand Trunk and Allan's steamers, on account of the deadlock at Portland. There are miles of freight cars waiting to be unloaded at that point, besides the overcrowded freight sheds. Messrs. Allan throw the blame on the Grand Trunk, and vice versa."

The company attributes much of the blockade to the interruption of traffic arising from the change of gauge, but it seems as if this should be only temporary.

Rockford, Rock Island & St. Louis.

This company has applied for an injunction to restrain the clerk of Rock Island County, Ill., from entering on the books the tax levied on its capital stock. It is intended to test the right of the State to tax the stock of incorporated companies.

Milwaukee & St. Paul.

A compromise agreement has been made with the city of La Crosse, Wis., by which the city agrees to give the right of way for a track from the present depot to the depot grounds on the river. The company agrees to build a substantial brick depot on the new site and to run a through car into La Crosse from all through trains. Nothing is said in the agreement about the bridge controversy, but there appears to be an understanding that all opposition to the location of the bridge above the city shall be withdrawn.

The company has paid the two years' tax on the River Division from St. Paul to Winona, which has been in dispute for some time. The amount was $4,900.

Mobile & Ohio.

The Attorney-General has directed the suit brought against this company to recover duties paid to the Confederate Government during the war to be dismissed, and all further proceedings to be suspended.

Valley, of Virginia.

Application has been made for an injunction to restrain the authorities of Roanoke County, Va., from levying a tax to pay interest on the county bonds issued in aid of the Valley Railroad. It is claimed that under the present Constitution of Virginia the Legislature has no power to authorize counties to subscribe to the stock of corporations or become interested in any work of internal improvement. The decision of this question will involve quite a number of county subscriptions.

Montclair.

Steps are being taken to foreclose both the first and second mortgages. Efforts are being made for a reorganization on an equitable basis, involving an adjustment of all claims.

Kansas Central.

The Leavenworth (Kan.) *Times* states that the company has closed a contract with parties in London who agree to commence work next spring and to complete the road to Denver, Col., in five years from the present time on condition that the counties through which the road is to pass furnish aid to the amount of $4,000 per mile.

Missouri River, Fort Scott & Gulf.

This company announces that it will be unable to pay the coupon due New Year's on the $5,000,000 of its first mortgage 10 per cent. bonds. Its earnings for 1873, estimating for December, will be about $700,000 gross and $230,000 net, against $681,910 gross and $241,679 in 1872; and the receipts from land sales, etc., were $86,818 in 1873 against $102,353 in 1872. Thus the net receipts of this year are about $316,818, which is $27,214 less than last year. The company, however, has a floating debt of more than $360,000. The land sales have been large, but comparatively a small part of the price is received during the year of the sale, and the company has due more than $2,000,000 for lands with $245,000 of unpaid interest. The value of the lands unsold is estimated at $2,641,848. The company also owns $505,600 of county and town bonds, the validity of many of which is pending in court.

As $500,000 is required to pay the interest on the first mortgage bonds, which is one-half more than the disposable receipts of either of the two years past, and as the second mortgage bonds require $194,700 more—together more than twice the surplus of 1872—it is concluded that the company cannot hope to pay all its interest for some years. The company proposes that the bondholders accept 8 per cent preferred stock for the coupons of 1874 and one-half of the coupons of 1875; the holders of second mortgage bonds are asked to exchange their bonds, with the coupon due last October, for a preferred 8 per cent. stock. The exchange of a 10 per cent. bond for an 8 per cent. stock may be unpleasant, but as if it is not accepted the road must be sold to satisfy the first mortgage, and the second mortgage bonds be made worthless, the exchange will after all be an advantageous one. The company announces that "several years will elapse before their interest can be earned."

By this plan the only payments required on account of interest for two years will be $250,000 in 1875, and this will probably permit the retirement of the floating debt.

We believe that the stock of this company is held chiefly by its bondholders, so that one party is not likely to do injustice to the other.

Southern Minnesota.

The foreclosure sale will not take place January 15, (as stated last week,) but that is the date up to which new arguments can be filed. A committee of the bond-holders has prepared a plan for bidding in the road under the foreclosure and a reorganization by which the 8 per cent. construction bonds shall be replaced by 7 per cent. bonds, the interest on which to the amount of one per cent. shall be payable in preferred stock for the first two years, if the net earnings are not sufficient to pay the value in cash; the overdue coupons, down to April next, shall be paid in preferred stock; the holders of these bonds and preferred stock shall choose all the directors except two, who shall be chosen by the holders of common stock, into which will be converted the 7 per cent. equipment bonds, at the rate of $8,500 per mile, while the holders of the present common stock and the floating debt will receive the new common stock at the rate of $1,500 per mile, if they will agree to the plan.

This plan will give a capital account per mile as follows:

7 per cent. bonds	$20,000
Preferred stock	4,400
Common stock	10,000
Total	$37,400

and the directors are to have authority, with the consent of a majority of the common stock, to issue second mortgage bonds at the rate of $2,000 per mile for equipment and repairs.

This organization will require for interest payments net earnings of $1,200 per mile for the first two years, and $1,400 thereafter.

Indianapolis, Bloomington & Western.

In the towns of Oran and West Lincoln, Ill., temporary injunctions have been obtained restraining the collection of the tax levied to pay interest on bonds issued in aid of the construction of this road. The cases will come up for trial shortly.

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